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The Welsh.

BY JOHN GILLESPIE EWING.

BY the term "Welsh," the makers of our dictionaries tell us, is meant the inhabitants of the land of Wales; and they further say that the Saxon "wealh" or the Germanic "wälsch," from which it is derived, was applied by the Germanic peoples to all strangers. Neither of these statements are historically accurate, and they have been the cause of confusion and error in the treatment of the history of the British isles. Ethnic names have their origin in three causes: unity of blood, unity of language, unity of political and legal rights. Sometimes one, sometimes another of these tests is used in grouping the same men together. They are none of them absolute; yet of the three, with all its changes, the last unity—that of political and legal rights—is the most enduring, and the one usually adopted in the past. The origin of the term Welsh has reference to such a unity. It was first applied to a number of men once bound together by the possession of common political and legal rights. It was long applied to all the descendants of these men; was then confined to those of them who maintained a distinctive legal existence; and, finally, in this age, which seeks to determine race by language, is frequently restricted to those who speak, or whose ancestors spoke, what is known as the Welsh language. To understand the term, as historically used, is to enable us more clearly to perceive the realities of early British history.

In the year 43, during the reign of the Emperor Claudius, the Romans began the conquest of Britain. They carried their arms to the extremity of the island, reduced the greater portion, and formed it into provinces that were, by Diocletian, joined under the one governor, known as the vicar of the diocese of the Britains. The diocese of the Britains included all the island up to the Firths of Forth and Clyde, and possibly beyond the Firths to the foothills of the mountains of Scotland. It thus included all England and Wales and the greater part of the Lowlands of Scotland. During the course of the fifth century, the rule of the Roman emperors ceased in the island, in consequence of the weakening of the imperial authority in the West. With the ending of imperial rule in Britain, the inhabitants of the Roman diocese were unwillingly thrown on their own resources. They were practically the descendants of the men whom Cæsar and Agricola had met in their invasions. True, the long rule of the Cæsars had caused an infusion of foreign blood in the island; but the number of those of foreign descent was small in comparison with the descendants of the Britons of Cæsar's day. But the men of the land when the Romans conquered it, were not of one race. Native traditions state that three friendly races occupied Britain—the Cymry, the Lloegwry and the Brython. When the Romans united them under their rule, they respected their political distinctions, and made an effort to destroy them. As in Gaul, the olden distinctions between and among Belgæ, Galli and Aquitani were not destroyed by the Romans, so in Britain the Cymry, Lloegwry and Brython

with their political divisions still remained. The inhabitants of the diocese of the Gauls were all confounded in common speech under the term Gauls, differing though they did, as Cæsar says, "lingua, institutis, legibus." So in Britain, all were confounded under the term Britons, which was strictly applicable but to one of the races. We cannot set out the exact situation of these races in the island; but their boundary on the north was the limit of the Roman diocese, in which they were all included.

When the Roman rule ceased in Britain, all freemen in the British diocese were legally Roman. Living under the Roman rule, they became such by the decree of Caracalla. As Ulpian said: "In orbe romano qui sunt, ex constitutione imperatoris Antonini, cives romani effecti sunt." From the issuance of that decree all distinctions between the peoples under the sway of Rome and the citizens of the Roman state disappeared in the eyes of the land, and they all became politically and legally Romans. So that the freeman, who was born in Britain of ancestors settled in the land before Cæsar gazed upon its shores, was in every respect as much a Roman as one who boasted of Patrician blood. The freemen who dwelt in the limits of the Roman diocese were the Romans of Britain, and on the ceasing of imperial rule they appear contending with the invaders of the land.

Of these invaders the most noted were those of Germanic race, who succeeded in establishing their sway over the southern and eastern shores of the island from Southampton Water to the Firth of Forth, and made the land the land of Englishmen. To the men of the land who resisted them the invaders gave the name of Wealas, or Welsh. This term signified in their minds anyone who was a member of the Roman state. In the Traveller's Song the gleeman calls the realm of the Cæsar, Walaric or Welshry; and in verse 140 he alludes to the Romans of the East as Rum-walas. And in like manner the Saxon grammarian Ælfric, in his Glossary, renders the legal term, "jus quiritium" by "Weala sunder riht." The term was used by all the Germanic peoples of those who were Romans, and of none else. Neither to the Slavs on the east, or to the peoples of the British isles who were not Romans did they ever apply the term.

The Germans of the Continent called the Italians and their language Welsh, and their land Wälschland. In Luther's version of the Bible, Acts x., 1, we read: "Cornelius, ein Hauptmann von der Schaar, die da heist Welsche." "Cornelius, a centurion of the band called Italian." The Norse Sagas speak of the land of Gaul as Walland; and Galwealas is the usual term employed by the Saxons for the men of the same land. The French friends of Edward the Confessor are called by the contemporary authorites, "tha Welisce menn"; and Edward is said to have come "hider to lande of Weallande." The term Walloons in Belgium, of canton Wallis in Switzerland, are applied to the descendants of one time Romans, and the land they dwelt in. So in the far East, the Slavs, who first knew the Romans through the Goths, called them Vlach or Wallack, an adaptation of the Germanic term. And the people in eastern lands, to whom the term is still applied, know themselves as Rumeni, or Romans.

Thus the term of Wealas or Welsh was applied by the Saxons and English to all the inhabitants of the Roman diocese of the Britains. Hengist in Kent, Ælla in Sussex, Cerdic in Wessex, and Ida in the far North, all appear contesting with the Wealas or Welsh. In singing of the battle of Brunanburh in 937, the poet says: "Since from the East hither, Angles and Saxons came to land, o'er the broad seas Britain sought, mighty war-smiths of the Welsh o'ercame." In the island the term was used of all who dwelt within the limits of the Roman diocese and of none other. It was not applied to the Scots of Ireland or the Picts of Alban; not even to the Picts who established themselves within the limits of the diocese in Galloway. It was used to denote those men who, or whose fathers, were once one through their political and legal unity as Roman citizens. The term was not used by these men speaking of themselves. As in the East, the Vlachs of the Slavs call themselves Rumeni, so the Welsh of the English call themselves by their national names as the Cymry.

The Welsh of the south and east of England disappeared, their distinct national existence giving way before that of the Angles and Saxons. In the western half of the Scotch Lowlands, they long survived, first with a distinct legal existence, and then as subjects of the Scottish kings. Their territory comprised the olden dioceses of Glasgow and Carlisle, and extended from the northern limit of Dumbarton or Lennox to the river Derwent in England, the southern limit of the diocese of Carlisle. This was the land of the Strathclyde Welsh, the Strælcledwalas of the chroniclers, who in the charters of the Scottish kings—who in the eleventh century extended their direct rule

over this region—are called Walenses. In the extreme southwest of the island, a second body of the Welsh long maintained their legal and political identity, the West Wealas or the Cornwealas, the Welsh of the Horn or of Damnonia. To neither of these peoples is the term any longer applied, difference even of language having disappeared between themselves and the English or the Scotch. It is used but of the inhabitants of the land lying between the two, the Wales of to-day, the land of the North-Wealas or North Welsh of former times. There in that land the term has, in the progress of time, been further perverted from its original meaning, until it is confined almost entirely to those who speak the Cymric speech.

As originally used, the term is no longer applicable; as now used, the term is most misleading in the reading of history. For the Welsh of the days of Hengist and Cerdic were not the speakers of Cymric speech alone, but all the Romans of the diocese of the Britains, all the freemen of the land.

Plato's Teachers and Teachings.

BY JAMES A. M'KEE, '93.

I.

THE times make the man. There never would have been a Cæsar had there not first been a Pompey. Not so much as the names of Napoleon and Hannibal would have been given to posterity had not the condition of the times afforded those heroes an oppportunity which, once grasped, made them the wonder and admiration of their age and of succeeding generations.

A more important factor in the attainment of greatness is the existence of circumstances which may tend to the development of man's ability. It need not be said that however gifted he may be by nature, the ruler or director must be superior to those whom he governs. But, more than all else, he must win the confidence, respect and esteem of his subjects. He must show them that his word is as good as the fulfilment of a promise. The one who is to direct and govern a state must first show that he is capable of being governed; since he is not to turn a deaf ear to the advices and admonitions of those under him, but act upon them in so far as they may be in accord with the order, harmony and wellbeing of the state. Let him understand that the right of the sword is no right, and he who places his authority in it will perish by it; for tyranny and oppression form a two-edged sword which cuts in both directions, and will in time destroy the one by whom it is wielded. Greece, at the time of the Peloponnesian war, was very much in need of such men. Those in authority had begun to look with disdain upon their subjects, and the the latter, in turn, had long since ceased to respect them. What could be expected from a people who had cast aside the laws of Solon and Lycurgus, and whose faith in the gods—as showing the influence of religious sentiment—had begun to decrease! The most thoughtful minds looked forward with awe, and backward with shame and regret. Even they who had not heretofore taken part in the ever-shifting scenes of politics began to arouse themselves from their former inactivity. To such a low state of degradation had the Athenian people fallen that the word and oath of no one was considered sacred. The long and protracted wars had begotten a natural antipathy and disgust in regard to the solution of all social problems, while in the law courts and assemblies men found ample means for the gratification of their ambition.

With the downfall of the oligarchy the democracy sought to conciliate the people by allowing them a share in the administration of the government; and this afforded them a means whereby personal aggrandizement might be attained. These events and circumstances gave a new impetus, and, as it were, encouraged the diffusion of ideas. The ambitious received this new change of things as a means of influence, and those who took no part in politics were encouraged to speculate and theorize. A new atmosphere was created, and became permeated with two distinct intellectual elements—the rhetoricians and the sophists. The latter seemed the most attractive, and men of various nationalities came to meet at Athens for the purpose of educating men for the requirements of civil life. Nor, indeed, were pupils wanting; but many young men among the wealthy and lowly classes of Athenians were found willing and ready to listen to the theories propounded.

At the same time we are in no degree surprised, having in view the different schools of philosophy before the time of Socrates, at the unnatural and unreal conclusions which men formed, and which carried them out upon

a sea more troubled and disturbed. Thales, who understood so thoroughly the nature of an eclipse that he could predict the exact time at which it would take place, betrayed complete ignorance in reasoning upon the origin of things. His theory, that water was the fountain from which everything sprung, was embellished and made immortal by one of the greatest of Greek poets, Pindar. The Ionic school of philosophy, the first in Greece, was founded by Thales, and some say that Socrates was a follower. Pythagoras of Samos was the father of the Italic school, and from his constant and exclusive studies of celestial phenomena we are not surprised in the least that he should think number and order constitute the essence of everything. With him it served to account for the harmony of sound and the movements of the heavenly bodies; but beyond this he did not care to go, or at least he had no thought of applying his principle to the notion of the beautiful, the true and the good. Anaximenses taught and believed that everything sprung from air. Had it not been for Diogenes this preposterous theory would have been buried in oblivion. Had Miletus and Anytus lived at that time they would no doubt have brought him before the tribunal as wanting in respect to the gods. He did not ignore the existence of the gods, but placed them inferior to air from which they sprung, thus making Æolus subservient to, and not the master of the winds. Who has not heard of Diogenes, the cynic, who was the first to demonstrate the value of fresh air by making the tub his only habitation? However it is to be lamented that he has had only a few followers whom posterity has branded as the fresh air fiends. (This is simply a parenthetical remark, introduced by way of rebuke, or admonition to the many cranky devotees of Hygiene.)

II.

The thoughts of men became eager, restless and disturbed, and the whole atmosphere of knowledge was permeated with a new uncertainty when Socrates appeared on the scene of human affairs. All philosophers before him had directed their time and attention to the investigation of natural phenomena, while he, on the contrary, first by example and then by word, attacked the problem of reform—regulation of manners and morals. Even had he failed in this, a life of self-sacrifice and devotion for the good of others would not have been without a reward. That Socrates did this because he was wearied of obscure and uncertain things—baseless speculations and half-proved conjectures—and wished to attain to the knowledge of the truth which was necessary to obtain a blessed life, and which, after all, must be the object of all true philosophy, and acted from purely disinterested motives, his life will be a sufficient proof.

Socrates taught that the knowledge of proper life and conduct could be acquired only by a perfectly enlightened mind; hence he concluded that the greatest diligence was absolutely necessary for the purification of one's life by good morals in order that the mind, freed from the depressing weight of sensuality, might, by its natural activity, lift itself to celestial objects and, with an understanding unsullied and free from everything low and degrading, might contemplate that unchangeable something from which life and matter sprung. In other words, Socrates believed that truth was the only criterion according to which all man's moral actions should be directed. As truth had heretofore been unknown, he felt that it was his duty to devote his life to the discovery of it and the exposure of error. Error, he said, arose from ignorance; and as there were a great many people who professed to know something when in reality they knew nothing, this lack of knowledge was antagonistic to truth. Now, his vocation was to eradicate from the minds of men these false notions, and he would do so by means of a cross-examination which in the end would lead the one questioned to the most ridiculous conclusions, displaying at the same time complete ignorance of what he professed to know.

All were at liberty to profit by Socrates' teachings. He did not exact payment for his lectures, as Gorgias, Prodicus, Hippias and Evenus did; but at all times, in all places and under all circumstances, whether in the gymnasium, in the market place, or in the public walks, he was willing to converse with each and every one who chose to address him. But by his manner of living he became an object of disgust to all classes. The old-time Athenians, together with Aristophanes, beheld with dissatisfaction the introduction of a system of inquiry which, from their point of view, shook to the very foundation the ancient ideas of morals and politics, and gave in return only an idle, babbling class of young men unfit for war and all the nobler occupations. Socrates thus incurred the odium of the lower and the jealousy of the upper classes who after a time rose up against him, and brought about the death of the best, the noblest and the most illustrious of all Athenians—one who bequeathed to posterity

a model worthy of admiration and deserving of imitation.

III.

Conspicuous in life and illustrious in death, Socrates left many disciples of his philosophy who took from his discourses what pleased them best and what seemed to be most in accord with the final good. But—"many men of many minds!" Various opinions were formed from his teachings and gave rise to different schools of philosophy, of which we may mention four: Aristippus, the founder of the Epicureans, held that pleasure was the final good. Antisphernes, who is looked upon as the first of the Stoics, taught that happiness was to be found in the rational disregard of pleasure and the feelings most natural to the human heart. The Epicureans and Cynics agreed that in poverty, want, painful toil and those things which are most repugnant to human nature the ultimate good was to be obtained. From Euclid sprang the Magarians or Sceptics, who identified the good with the hidden secrets of nature, while others of the same school asserted that knowledge of it was already known, but consisted in its application to a rule of conduct. On this one point the different schools of philosophy were united—that intellect was the most important of all man's faculties, and that the acme of science was reached in the contemplation of the good.

IV.

The founder of the Academy, PLATO, was the most distinguished of all the followers of the grand old Athenian, and far surpassed the other disciples of his good, noble and virtuous master. As the great law-giver Solon formulated and promulgated laws for the general welfare of the state, so did Plato lay down rules, precepts and maxims which were designed to correct the morals of the people. By birth an Athenian, he was thoroughly acquainted with the laws and familiarized with the condition of his fellow-citizens. A cosmopolitan education, acquired by untiring and extensive travel, contributed the invaluable advantages of experience to supplement the teachings of the master-philosopher, Socrates.

At first the political troubles and disturbances, of which the death of Socrates is an example, forced Plato to leave Athens for a while. After ten years of travel and study he returned to his native land thoroughly imbued with the determination to awaken in the Athenian people honor and reverence for a man whom they had despised. If they could be taught to love Socrates, who always held in the highest estimation the good, the noble and the pure, they would naturally hold in the highest regard the principles for which he died.

To this end Plato introduces Socrates in his dialogues as the Knight-Errant of chivalry, contending for those great truths which he wishes to engraft upon the minds of the people. In all the discourses he is found advocating some virtue, moral or intellectual. In the "Republic" the tyrant Thrasymachus, who holds that might is right, is represented in the glowing colors of a brute, not a man. In all the dialogues the solution of the problem is not given directly but rather indirectly. Thus the evil, with its bad fruits, is shown; while contemplating the conduct and character of Socrates one is led to realize the benefits which always accompany the good. The absurdity of the false is the appreciation of the true. Temperance is discussed in the "Charmides" leaving the question unsettled in the mind of the young man who ends, however, by becoming a disciple of Socrates.

V.

Now the question arises, why is it that so much cross-questioning should be found in the Platonic philosophy? It certainly has the appearance of overthrowing the laws and opinions of men, leaving them in doubt and error. Yet such is not the intention of the philosopher; for he uses this only as a means wherewith to separate the good from the bad, the false from the true. In a word, we may say that it is to teach men to distinguish well and observe closely. Truth can always bear with any amount of search and examination, error can not. The stronger and more searching the examination, the more distinctly is the truth unfolded.

Contrary to the belief at that time, Plato shows that pleasure is not the absolute good; for with him it is the good man that enjoys pleasure, while the wicked, in gratifying his low desires and appetites, places himself on a level with brutes. The example of Socrates' death gave him the ideal of wisdom, courage, temperance and justice. In the "Republic" he shows that these four cardinal virtues are essential to the happiness of the individual and the welfare of the state. Yet in this same Ideal Republic he has made a grave mistake which, if it were carried into execution, would be the ruin of human society.

Respect for the gods and regard for the laws lie at the very foundation of all his philosophy. He would exclude the poets from his Ideal Republic, because he thought that the minds

of the citizens would be depraved by their fictions. They would show to men the worst possible examples under the appearance of divine action. How could the gods exert a good influence on the people, when the poets were constantly setting forth their crimes and vices.

In short, with Plato everything should be done for the sake of good, for from it proceeded all those great ideas which are necessary to obtain a blessed life. The good is identified with the intelligence which is the cause of existence and the end in reference to which the whole life is to be regulated. This intelligence is the Lord and Maker of all things and far superior to the gods. It is the ultimate cause from which everything proceeds. It is the ruler; the gods are the servants, and from it their authority comes. Plato believed that the most noble part of man, the soul, came from this supreme and all-excellent intelligence. He maintained that the soul is of the same nature as the intelligence from which it came; consequently, free from decay and the dissolution of the body.

How forcibly does this teaching, apart from its pantheistic suggestion, appeal to every thinking mind, especially to the Christian, realizing, in their proper sense, the words of the Apostle: "We have been made partakers of the Divine Nature!" True it is that the charm which permeates all Plato's writings, and which has made him a favorite with both Christians and pagans, lies in the purity and simplicity of his works.

The Conquest of the Air.

"For I dipped into the future, far as human eye could see,
Saw the vision of the world, and all the wonder that would be:

Saw the heavens fill with commerce, argosies of magic sails;
Pilots of the purple twilight, dropping down with costly bales;

Heard the heavens fill with shouting, and there rain'd a ghastly dew;
From the nation's airy navies, grappling in the central blue;

Far along the world-wide whisper of the south-wind rushing warm,
With the standards of the peoples plunging through the thunder-storm;

Till the war-drum throbb'd no longer, and the battle-flags were furl'd
In the Parliament of man, the Federation of the world."

—*Locksley Hall.*

For our confidence in the ultimate solution of any great problem may fairly rest on the indications of a steady improvement of the means to be employed and a steady diminution of the difficulties to be met, we ought to be quite hopeful of the future of aerial locomotion. The progress of this science has, within recent years especially, been so decided in all its branches that many a student who at the beginning of this decade wavered in his faith, now believes with all the firmness that springs from an understanding of the relation of the means to the end. The progress has not, perhaps, been an evident one; to the bulk of mankind who measure the march of a science only by its epochal achievements, apparently little has been accomplished; but to closer observers the advancement, both in the branch of aviation and of aeronautics, has been as uniform, as continuous, as absolutely positive as that of any branch of engineering or of architecture.

HISTORY OF AEROBATICS.

Even the casual reader, who may know little and care less for the principles of aerobatics (or aerial locomotion), might, from the chief facts of its history, argue that the period of its usefulness cannot be far distant. In the department of aeronautics he must have observed that the efforts to drive and guide vessels through the air have multiplied with the advance of years, and assumed more seriousness and importance.

The balloon was invented in 1783. For sixty-nine years it remained a mere buoy, frail and helpless as a cloud. In 1852, through the genius of Giffard, the buoy became a ship provided with rudder and propeller, prow and stern; that is, the great globular float became a pointed vessel for cleaving the element it must penetrate.

The speed of Giffard's balloon, which was propelled by steam power actuating a screw, is reported to have been from four and a half to six and a half miles per hour, or about the same as that of the first steamboat. Ten years later M. Dupuy de Lome greatly improved the method of construction and inflation of the balloon; but, unfortunately, employed men instead of a steam motor to operate the driving-screw. Still he attained a speed of over six miles per hour. Eleven years later the Tissandier brothers, employing a similar balloon driven by electric motive power, obtained a speed of 6.7 miles per hour, and two years after raised this record to 8.9 miles per hour.

In the meantime the French government had been preparing a balloon, which for the beauty of its outlines, the strength of its construction and perfection of its propelling apparatus, should excel everything thus far attempted. When finally launched, August 9, 1884, it immediately rose in the air and began its memorable voyage to Calais at a speed of over twelve

miles an hour. It thus appears that the speed of the air-ship advanced as far in a score of years as that of the water-ship in half a century.* The casual reader would, therefore, be not far wide of the mark if, reasoning from analogy, he should anticipate the eventual conquest of the air by means of buoyant vessels.

THE SCIENCE OF UNBUOYANT FLIGHT.

The other branch of aerobatics has a no less promising history. The science of unbuoyant flight, or of aviation, as it is commonly named, has steadily prospered from the first crude sketches of Leonardo da Vinci up to the recent marvellous achievements of Mr. Maxim. Despite the multitude of flying fools and visionaries, men have gradually accumulated positive knowledge, either from pure reason, or from experiment, or from the collateral growth of the other sciences. A mathematician, for example, demonstrated the utter impracticability of human flight by the sole energy of the human muscles; an ornithologist studied minutely the evolutions of the great masters of flight, shot the birds, weighed them and measured them; another naturalist gave us the anatomy of the bird in its relation to flight; another harnessed the birds, and recorded, by the most ingenious and persistent experimentation, all the movements of the bird during flight; another fertile experimenter constructed artificial birds which flew and hovered in the air, balancing themselves even against the unsteady wind; another studied the resistance of the air; another the capabilities of artificial motors. This is thorough and real scientific work, though unapparent. It has not, indeed, lifted a man and sustained him aloft, even for one minute; but who shall say that it is destined to do so? And let us remember that the mere sustentation of a heavy body on wings is equivalent to a substantial solution of mechanical flight; for it is well known that to simply hang motionless in the air requires more energy than to fly forward with a velocity of fifty or sixty miles an hour.

To realize more fully the extent of the growth of aviation it will be well to consider the history of two questions: first, the power required for flight; second, the capacity of artificial motors. The summary of the first question has been very briefly presented by Mr. Maxim as follows: "Many years ago a mathematician in France wrote a treatise in which he proved that the common goose in flying exerted a force equal to two hundred horse-power; another proved that it was only fifty horse-power, and he was followed by still another who proved, very much to his own satisfaction, that it was only ten horse-power. Later on others wrote to prove that a goose expends only about one horse-power in flying. At the present time, however, many mathematicians can be found who are ready to prove that only one-tenth part of a horse-power is exerted by a goose." This is evidently an advancement of two hundred thousand per cent. in favor of human flight. It may be added that Mr. Maxim, reasoning from the data of his own carefully-conducted experiments, would reduce even this estimate: "The goose would," says he, "exert no more than .083 of a horse-power, which is rather more than a man-power, and is at the rate of 144.5 pounds to the horse-power."

THE INCREASING EFFICIENCY OF MOTORS.

The efficiency of motors has increased most wonderfully. In the first rude essays at human flight the only available source of power was that of the human muscle, which meant at least a thousand pounds per horse-power, if continued for any considerable time. Giffard's steam-engine and boiler taken together weighed, according to his own report of September, 1852, one hundred and ten pounds horse-power. Some years later Mr. Stringfellow constructed a small model which is said to have weighed only thirteen pounds per horse-power. This, though never thoroughly tested, was for a long time referred to as a triumph of mechanical skill. While both scientific and unscientific writers were debating the possibility of ever constructing a large motor of like efficiency, Mr. Maxim went resolutely to work and at one step reduced the weight to less than ten pounds per horse-power. This achievement certainly astonished the scientific and engineering world.

For generations even the most conservative were willing to admit the possibility of mechanichal flight when the motor should be produced equal to the birds in lightness and power. To many this seemed impossible. Indeed one philosopher, but shortly before Mr. Maxim's success, demonstrated, in the most eloquent and positive language, that such an achievement was absolutely impossible. Nature had tried for centuries to produce a relatively lighter prime mover than the bird, and had failed; it was, therefore, senseless for man to hope ever to do so. But man has done so; and now that he has so completely out-stripped Nature, who will ever again look to her as sole mistress? To add to

* Since the writing of this article the French government has announced a new war-balloon which is to realize a speed of twenty-eight miles an hour.

the chagrin of such prophecy Mr. Maxim expresses the belief that a useful working steam machine and boiler can be constructed to weigh but five pounds per horse-power: "I am of the opinion," he writes, "that with a generator and engine especially constructed for lightness a naphtha motor could be constructed which would develop one hundred actual horse-power, and not weigh more than five hundred pounds including the condenser, and still have a factor of safety quite as large as we find in locomotive practice." It may be added that the development of the gas-engine and electric motor has been quite as remarkable as that of the steam engine.

THE CARRYING POWER OF AEROPLANES.

Now that the iron Pagasus has been haltered, it may be asked what burden he will bear on his back after his wings have been properly plumed? The answer, fortunately, has been to some extent cleared by the systematic experiments of both Mr. Maxim, of England, and Professor Langley, of the Smithsonian Institute. After many thousands of delicate measurements of the carrying capacity of inclined planes gliding on the air, Professor Langley informs us that one horse-power properly applied to the propulsion of an aeroplane may sustain fully two hundred pounds and upwards. Mr. Maxim, who experimented with much larger planes, concludes that certainly as much as one hundred and thirty-three pounds may be sustained with the expenditure of one horse-power, and, under certain conditions, as much as two hundred and fifty pounds. It would appear from these statements that a well-designed flying-machine of the aeroplane type should be able to carry not only itself, but many times its own weight besides. Nay, even if the supporting plane were omitted altogether, an engine of such extreme lightness as that of Mr. Maxim ought to screw itself through the atmosphere with the velocity of an arrow. It is, indeed, venturesome to assert what such a motor may not do. One naturally pictures to himself the whole wide heaven filled with coaches and chariots; the rivers and lakes covered with boats that go skipping over the solid water with more than railroad speed, to say nothing of the sterner possibilities that may ensue.

CONFIDENCE IN THE SOLUTION OF THE PROBLEM.

To one who yearns for the extraordinary in engineering there is something delicious in the assurance of our modern aerobaticians—they are so utterly without doubt. It is true there have been from the dawn of time enthusiasts who have looked for the immediate accomplishment of human flight, even at their own hands; but they were the dreamers, not the scientists, of their day. We can now name scores of men who have won distinction in both theoretic and applied science, who, having examined the conditions of this problem, express an unwavering confidence in its near solution. This is especially true of those who have studied the matter most minutely. Professor Langley, at the conclusion of his admirable researches in aerodynamics, thus writes: "I wish to put on record my belief that the time has come for these questions to engage the serious attention, not only of engineers, but of all interested in the possibly near solution of a problem one of the most important in its consequences of any which has ever presented itself in mechanics; for this solution, it is here shown, cannot longer be considered beyond our capacity to reach." And concluding an article in the *Century*, September, 1891, he expresses himself in this unequivocal sentence: "Progress is rapid now, especially in invention, and it is possible—it seems to me even probable—that before the century closes we shall see this universal road of the all-embracing air, which recognizes none of man's boundaries, travelled in every direction, with an effect on some of the conditions of our existence which will mark this among all the wonders the century has seen." A month later, Mr. Maxim, after discussing the requirements of flight and the means by which it may be compassed, declares: "The motor has been found, its power has been tested, and its weight is known. It would, therefore, appear that we are within measurable distance of a machine for successfully navigating the air; and I believe that it is certain to come whether I succeed or not." Mr. Chanute, who may be very aptly styled the critical historian of aviation, and who as late as 1890 still expressed a lingering uncertainty as to the prospect of aerial travel, has within the past year written an exhaustive account of flying-machines to prepare his countrymen for the "coming events." It will please all who have followed his writings to learn that he has lent his time and wide experience to the promotion of an international congress for the World's Fair for the advancement of aerial locomotion.

The partisans of aeronautics are no less sanguine than the writers above quoted. Since the period of the first trial of a pointed balloon there has always existed a school devoted to the science of the air-ship. Mr. Giffard, after

the success of his first experiments, prepared the plans of a mammoth vessel, which was to be propelled at a speed of forty-four miles an hour, even with the engines he could then command. So confident was he, indeed, that he obtained a patent for, and meant to venture the expense of constructing a balloon nearly two thousand feet long—a work he would undoubtedly have attempted had not blindness overtaken and prevented him. The Tissandier brothers, who for some years labored so arduously in the cause of aeronautics, seem to have become but the more convinced that it is only necessary to increase the size of the balloon to insure its success. Writes the editor of *La Nature:* "Il n'y a plus qu'à faire encore un pas en avant avec des appareils plus puissants, plus légers et des aérostats plus volumineux."

Perhaps the most significant indication of the approaching importance of aerobatics may be observed in the serious attention devoted to it by the European powers, the costly investigations they have instituted, and the profound secrecy maintained. If we are to believe the frequent rumors of foreign newspapers, and the surmises of semi-political writers, both the German and French governments are prepared to body forth at any time the unlovely vision of Tennyson.

MANNER OF SOLUTION—THE TWO SCHOOLS.

But how is the dread prophecy to be realized? Shall the "pilots of the purple twilight" float or fly?—that is the one question over which the sages of the schools have been wrangling for half a century. The aeronauts boast of having at least fairly launched themselves, while the aviators have not been able to quit the earth. The aviators in turn point to the birds which move with such celerity and ease, while the great gas-bags drift helpless in the torrents of the atmosphere. Perhaps ere long it will be discovered that there is room in the sky for both; for certaintly each school has plausibly met the objections urged against its propositions.

It is singular that such diversity of opinion should exist between the schools, especially among those who investigate seriously; yet it seems that those who excel in one system will concede least to the advocates of the other. Mr. Maxim, for example, in considering the outlook of aeronautics, declares that "it is quite as impossible to propel a balloon with any considerable degree of velocity through the air as for a jelly-fish to travel through the water at a high rate of speed." How different the opinion of Giffard and the Tissandier brothers!

To prepare the dirigeable balloon to run at high velocities it will be necessary to keep it constantly rigid, and to locate the propellers near the centre of resistance. The first of these requirements can be fulfilled by inflating the balloon under pressure; the second, by planting the propellers directly on the covering of the vessel. This means that the balloon should be made of metal, and hence that it should be of titanic proportions. Here, of course, lies the great difficulty; for while it may be simple enough for a mathematician to dictate the most favorable dimensions for an air-ship of great strength and speed, the realization of his figures may present insuperable difficulties to the financier, if not to the mechanician.

A PROPOSAL.

It may, however, be of interest to consider merely the physical possibility of such a construction. Selecting *La France* as a model, let us estimate the capacity of an air-ship of ten times her linear dimensions. The data we shall require are as follows: length of *La France*, 165 feet; greatest diameter, 27.5 feet; surface, 10,000 square feet; buoyancy, 4,400 pounds; speed, 12 miles an hour; resistance, 50 pounds. Remembering that the buoyancy of a balloon increases as the cube of its linear extent, while the surface and resistance increase only as the square, we have for a balloon of ten times the linear measurement of *La France* and moving twelve miles an hour the following: length, 1,650 feet; greatest diameter, 275 feet; surface, 1,000,000 square ft.; buoyancy, 4,400,000 pounds; resistance, 5,000 pounds. The power required to overcome a resistance of 5,000 pounds 12 miles an hour, allowing an efficiency of 50 per cent. for the screw propeller, would be 320 horse-power, which, if supplied by a motor of Mr. Maxim's design, would imply a weight of only 3,200 pounds. Suppose the motor to weigh 400,000 pounds, or 125 times the weight above found necessary, we still have left four million pounds surplus buoyancy. If we allow three million pounds for the covering of the balloon, and construct it of sheet steel, the metal may be .07 of an inch thick, and capable of sustaining an internal pressure of sixty to seventy pounds per square foot, or two hundred times the resistance of the air against the most exposed parts of the vessel's prow. It is evident that a balloon of such strength and inflation would require no net, and that both motors and cargo could be attached directly to the covering; hence, if the propellers were properly located,

(*Concluded on page 492.*)

NOTRE DAME SCHOLASTIC.

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The attention of the Alumni of the University of Notre Dame, and others, is called to the fact that the NOTRE DAME SCHOLASTIC now enters upon the TWENTY-SIXTH year of its existence, and presents itself anew as a candidate for the favor and support of the many old friends who have heretofore lent it a helping hand.

Students should take it; parents should take it; and above all,

OLD STUDENTS SHOULD TAKE IT.

Terms, $1.50 per Annum. Postpaid.

Address EDITOR NOTRE DAME SCHOLASTIC,
Notre Dame, Ind.

—Mr. W. W. Carnes, the well-known elocutionist of Chicago, gave an entertainment in Washington Hall before the students and Faculty on Wednesday last. Mr. Carnes is a master of his art. He has a deep, rich voice of remarkable compass, and is possessed of a wonderful capacity for mimicry, displayed equally in the husband's soliloquy—about two o'clock in the morning spoken with intermittent stresses and hiccups—as in the voluble Irishman, seeking redress at the "Water office." Probably, the best selections of the evening were the good old "Hoosier" poet's "Down to the Capitol," and Oliver Wendell Holmes' companion-piece to the "One Horse Shay." The programme was altered by Mr. Carnes on account of a cold from which he was suffering. Though he was not on this account at his best, his ability as an elocutionist was no less appreciable.

The intermissions between the recitations were filled up in a delightful manner by our local musicians. Master A. Yglesia, of the City of Mexico, deserves special mention for his rendition of a piano solo entitled "Lucia Di Lammermoor." Master Yglesia is only fourteen years old, and has not been with us long enough yet to learn our language conversantly. His remarkable musical talent, however, makes him well known amongst us.

This was the last of the series of lectures, and the University concert season will be delightfully closed this (Saturday) afternoon by the N. D. U. Cornet Band, a report of which we expect to give in our next number.

—A number of students and members of the Faculty assembled in the Lemonnier Library Sunday afternoon to witness the unveiling of the bust of John Boyle O'Reilly. His effigy was curtained with the American flag in impressive consistency with the generous, patriotic spirit of him whom we honor.

The presentation address, in the name of Mr. C. T. Cavanagh, '91, was delivered by Mr. Thos. Cavanagh, '95. He extolled the generous deeds of the illustrious poet and exile in a perfect manner, applying to him Boyle O'Reilly's own lines written in eulogy of Wendell Phillips:

> "Races and sects were to him a profanity,
> Hindoo and negro and Celt were as one;
> Large as mankind was his splendid humanity,
> Large in its record the work he had done."

After the presentation and unveiling Rev. Vice-President Morrissey arose and, in acceptance, spoke at length, extolling the eminent characteristics of the illustrious dead and the appropriate nature of this testimonial to his memory on the part of the generous donor. He said, in substance:

"It gives me great pleasure to accept, in the name of the President and Faculty of the University, this bust of the illustrious John Boyle O'Reilly. This generous donation of Mr. Charles Toner Cavanagh, of the Class of '91, is highly appreciated by his *Alma Mater;* and no better proof of his interest in her welfare, and of the great work in which she is engaged, could be given than the presentation of the likeness of the great man in whose character shine resplendent so many sterling qualities that deserve consideration and attention from every true student, and which the brother of the donor has so clearly set forth in his address of presentation. Charles Cavanagh honors himself in thus honoring Boyle O'Reilly; and I feel assured that you, young men, who are present at the unveiling, as well as all the students of Notre Dame, are duly appreciative of the efforts of

one of the old boys in thus helping to perpetuate the memory of a great and good man."

The bust is from the studio of Max Bachman, of Boston, and is pronounced by Dr. Roche, of the *Pilot*, and Gen. Collins to be the best bust of O'Reilly ever made. The pedestal will be finished in a few days, when it will be placed in the gallery of distinguished Catholic laymen in the University building.

The Man in the Tower.

The college world is a microcosm, embracing as many characters as there are persons composing it. There you will find every type of boy from the tell-tale tattler, with whom even the authorities have no sympathy, up to the big domineering bully; but of them all, the latter, though not the meanest, is, nevertheless, the most unmanly. At the very instant when he appears to be showing his commanding influence, the bully knows in his heart he is not bold enough to admit his guilt and win thereby the sincere admiration of those whom he has offended. He continually usurps the rights of his companions; he puts himself where he is not wanted, and in case of resistance being offered to him, he rolls up his shirt sleeves in defense of his principle: "Might makes right."

Frequently this fellow is nothing short of a bluff—blow upon a soap-bubble, and in the twinkle of an eye it is gone; but there are those whose pugnacious abilities have been tested so often and so severely that chance and fate have at last combined to bestow upon them a few scientific "pointers" drawn from experience in the "manly art." The fact that a bully has a little science for aggressive and defensive purposes proves that he has had an interesting if not exciting past. He comes from the cream of society, whose members belong to the sporting fraternity; he is cultured and refined in manners, and also in all artifices relating to his art. In a word, he deserves to be respected.

***

Yes, respect the bully; for 'tis the only effective way of vanquishing him. Be choice in your expressions; treat him politely, or don't *treat* him at all. Beg his pardon, and be very submissive to him when you find him discharging his affectionate duties to humanity. Oh! I tell you, it cuts him to the quick to respect him as a gentleman would respect a gentleman. Say little to him. Leave him to his thoughts; for they always bring him to court, and in his conscience he tries the case, never, I assure you, without experiencing a feeling of meanness.

***

Spirit and enterprise are the keynotes of progress, and if aided by a manly independence, all obstacles melt away before the sun-heat of advancement.

In a college world like our own, where the Faculty have exerted themselves untiringly to promote athletics, the students alone are responsible if games and amusements are permitted to languish and die out from want of interest,

Truly, it is surprising to witness the lack of spirit and independence among our boys. They are as helpless as a lot of grasshoppers without their hind legs. The passing spring days afford the most desirable weather for football; still our unconquered "eleven" prefer to rest on their "rep" rather than win new laurels.

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They are not the only ones. What about our ball players? Notre Dame has a base-ball reputation that strikes terror in the heart of collegiate nines. Is the standard to be held aloft during the year '93? or do the boys prefer to play horse another session like the last, rather than put up good ball?

***

While looking in another direction I noticed another regrettable thing. Where is the class organization of '93? Haven't they enough spunk and "get up" to continue the creditable society they formed in September?

There are many questions regarding class business which arise during the year, and how are they to be settled except through organization? No wonder the honor of publicly representing the class on special occasions is sometimes taken away from the class by the Faculty, and a post-graduate exercises the distinction—all due to a lack of united energy, spirit and organization.

The Conquest of the Air.

(*Continued from page 489.*)

the rudder also could be dispensed with. The one million pounds remaining for passengers, cargo and supplies would occupy relatively such small room that the general exterior of the vessel would appear plump and smooth as a whale. There would, therefore, be no boat, netting, or other projecting parts to oppose the progress of the vessel save the propellers jutting out from its surface; consequently it

should move with a relatively less resistance than *La France*. Hence to attain a speed of sixty miles an hour, or five times that above considered, it would be simply necessary to increase the motive power one hundred and twenty-five times, or to employ a motor weighing four hundred thousand pounds, which has already been provided for. It would appear from these figures that a metal balloon competent to carry many hundreds of passengers, at speeds rivalling those of the railway train, are among the feasibilities of mechanical science.

Perhaps the most serious physical questions to consider in the above design are those of inflation and the control of the internal pressure. It is evident that if the covering were simply closed like that of a rubber toy it would burst upon a slight variation of temperature or of barometric pressure. To obviate such a disaster it would be necessary to employ an internal balloonette, as practised with the silk balloons; and this is true for vessels of all possible magnitudes, as can be shown by a simple geometrical demonstration. It may, however, be possible to replace the balloonette by some other device—as, for example, by an arrangement for enlarging or diminishing the balloon itself. As to the inflation, it may be more practicable, owing to the great volume of such an aerostat, to forego the use of hydrogen and to fill the balloon at the mains of some great natural gas reservoir. It might thus be possible to employ the contents of the balloon to furnish a part of the motive power. The mechanical and financial difficulties to be met in perfecting the air-ship need not be considered here, as we have been merely speculating on physical possibilities.

It is to be hoped that more light will reach us in the days that are to come, and that the great crystal world above us will yield as fairly to man's dominion as the other worlds of land and of sea. It may be a vain aspiration, an unholy wish; but who can look into those azure depths and not long to float there with the lark and the swallow? Oh, yes! it is good for us to be there; soon, let us hope, we may rise and fall and toss on the billows of this aerial ocean, revelling in the land of the rainbow, the caverns of the storm-cloud, the home of the lightning. What plain utilities of life, what comforts or other favors the unbounded deep may bear, I reckon not; but surely it will be something to quit the toils of earth for the untrammelled vast of heaven; something to companion the eagles and neighbor the stars; something to unburden the spirit weighed with mortal care and let it soar, if but for a moment, amid the circling splendors of its native immensity—aye, there shall be rapture in the infinite heavens, and surely a moment of rapture is worth a month of comfort.—PROF. ALBERT F. ZAHM *in The Catholic World.*

Books and Periodicals.

—The fads of a typical athletic girl are described in a breezy and altogether delightful manner in "The Diary of an Athletic Girl," published in *Demorest's Family Magazine*, the May number of which is just received. In the same number is an especially apropos paper about the British Embassy at Washington, embellished with numerous superb illustrations, including fine portraits of the English ambassador and his family. "Ladies of the Administration" is another timely paper, illustrated with portraits of the wives of the President, Vice-President, and members of the Cabinet. "Round About the Columbian Exposition" gives many interesting points about the World's Fair; "Early Italian Painters" is a chatty descriptive article, illustrated with numerous examples of the pictures painted in those far-off days; and "The Queen of May" shows many beautiful views of scenes in Central Park on May day. The fiction in this number is especially good; "Society Fads" tells about the newest ideas in the fashionable world; all the departments are full to overflowing with interesting, hopeful matter.

—RECEIVED: From J. Singenberger, Saint Francis, Wis., the following excellent pieces of music: "Ave Maria," by J. G. E. Stehle, for alto and baritone solo and choir, with organ accompaniment.—"Easy and Complete Vespers in Honor of St. Joseph," (Officium votivum) containing Prelude, Antiphons, Psalms, Hymn, Magnificat, Responsories. For one, two, three or four voices, with organ accompaniment. By J. Singenberger.—"The Good Shepherd." Tableau for Declamation and female voices. (English and German text.) By J. Singenberger.—"Choice Ballads." For use in family-circles, college, academy and school-recreations; arranged for one and two voices, with piano accompaniment. This will be welcomed by music-lovers as a very serviceable collection—eighteen in number—of beautiful and appropriate songs. Six of the number are given with German and English words, the others only in German. Compiled and published by J. Singenberger.

Obituary.

Within the past two weeks the estimable wife of Dr. M. F. Egan has suffered the loss by death of a beloved brother and sister. All at Notre Dame extend their sincere sympathy to the bereaved family and unite in prayers for the repose of the souls of the departed. May they rest in peace!

Local Items.

—"Keep ducks!"
—Did you see the duel?
—Base-ball on Sunday is—
—Beware of the white horse.
—How do you spell (o-o-i-u)?
—Band concert this afternoon.
—Dick Jr. wants a mouse-trap.
—"Maria'r, I'm all unraveling."
—Who got the thirty-six cigars?
—No, he cannot play a jews harp.
—Did you hear Frank hello N——?
—You don't belong to the crowd unless—
—April showers *are* bringing May flowers.
—Where are the cricket "fiends" this year?
—Why do those four—always go together?
—Did "Dub's" *side-lights* go out for want of *gas?*

—That long walk nearly killed the little artist.

—"Jolly outlook!" The whole plan is enviable. Success!

—Dick admires the productions of the flower garden.

—"Puck" objects to having his hair pulled out by the handful.

—Why did Charles R. become so possessed on Thursday afternoon?

—Dick says, "convicted or unconvicted, I am ready to stand the ordeal."

—There is a scheme on foot to convert St. Mary's Lake into a ball-field.

—The Man in the Tower's plea for spring bonnets was perfectly *apropos.*

—Some say it was a rainy day, while others say it was a rather cold day. See!

—The man (or men) in the tower (is or are) doing very good work. Keep it up!

—"De fonte leporum" done into English reads "from the fountain of hares"!

—Duff says it was a costly revenge; but it is a poor insult that cannot be avenged.

—The *telescope*, the *bell*, and the *all-right* joker spears us no longer with his musty jests.

—The civil engineering class used a number of books in taking measurements Thursday.

—The scenery skirting the *boulevard* has been very much beautified during the past week.

—Mr. Ed. P. Flynn, of Brownson Hall, went to his home at Erie, Pa., Thursday afternoon.

—The Leonine Society feels deeply the absence of its worthy President, Father French.

—Shorty's attitude, as he covered left field, represented a saw-mill shut down for the want of fuel.

—Mr. M. P. McFadden has entirely recovered from his late illness, and has once more resumed his law studies.

—A. Vurpillat, of Brownson Hall, was a visitor at his home in Winamac, Ind., a few days this week.

—Sir John says that he got so tired playing ball this week that he had to draw his breath with a cork-screw.

—The new hand balls for the Brownson Hall association arrived this week, and the "fiends" are happy once more.

—Prof. Egan has the thanks of the Criticism Class for his presents of beautiful daffodils and sweet-scented violets.

—Tim has charge of the bats now, and even the burgomaster cannot make him deviate from his iron-clad rules.

—Wonder how that a auburn-haired youth, who received a brick, Valentine's day, appreciates his five-hundred lines?

—Dick's aquarium is getting to be quite a novelty, and is now engaged in building a salt water tank for fresh water eels.

—That spring is the *nutrix poetæ* no one will deny were he to read the score of sonnets written by the class of Literary Criticism.

—The "rosebud" man would like to know if a Turkish bath makes a person faint; and also if turning the hose on is the safest cure.

—Some of the boys that have been shouting "seven come eleven," are very prosperous. They received not only 11, but 989 more.

—The corner groceryman lost the combination to his safe this week, and would like to have some friend return it to him if found.

—There will be a game of base-ball between the South Bend nine and the 'Varsity nine on the Brownson campus to-morrow afternoon.

—The electrical engineering class began their experiments on electricity this week, and will soon have that wily fiend under their command.

—Fatty says he does not see why people call the donkey the dullest of all animals, when it has more bra(y)in' power than any other animal.

—Mr. and Mrs. H. C. Wilcox, of Three Rivers, C. W. Wilcox, of Niles, Mich., and Mr. Geo. Dexter, of Chicago, visited friends here the first of the week.

—After the election of officers Thursday afternoon there was a game of ball between

the specials and anti-specials which was won by a score of 15 to 11.

—Capts. Brady and Magnus had their team out for the first time Thursday afternoon, and played an interesting game. Captain Brady's men won by a score of 13 to 12.

—The Minims have an unusually strong nine this year, and are justly proud of them. Some of the games played on their diamond draw more spectators than older ones do.

—There promises to be a friendly rivalry between Sorin and Brownson Halls for supremacy on the base-ball diamond, and lovers of the sport are expecting interesting games soon.

—Rev. T. O'Sullivan, '58, of South Chicago, Hugh Mason, Esq., and Prof. W. W. Carnes, of Chicago, were very welcome visitors to the College on Wednesday and Thursday of this week.

—It has been suggested that three umpires be chosen to have charge of the base-ball games this session, and that at the end of the session one receiving the most votes be awarded a medal.

—Mrs. M. J. and Miss Angela Cooney, of Toledo, O., relatives of the distinguished missionary, the Rev. P. P. Cooney, C. S. C., made a very pleasant visit of several days at Notre Dame during the week.

—Fossie, Judge and Spike, trustees of "Poverty Flat," make the announcement that that famous spot will soon be turned into a summer resort, and the only fault found is the frogs which have to be encountered.

—Work on the new Community building is being pushed forward very actively. The hill, on the west side of the church, has been levelled for the foundation, thus presenting a completely new aspect of an old-time landmark.

—Under the new game law, according to an exchange, book agents may be killed from August 1 to October 1; scandal mongers, from January 1 to December 31 inclusive; spring poets from March 1 to July 1. Open season all the year around on insurance agents.

—Richard says a joke is a joke; and he likes to see the boys have all the fun they want, just so they don't get funny; but forbearance ceases to be a virtue when they hide a very necessary article of wearing apparel, and make it impossible for him to appear in public.

—"Why," asked the joker of second flat, "should the gambler be the happiest man on earth?" No one knew any reason for so thinking. Then the dear soul, smiling, said: "Because he always carries about him a *pair o' dice* (paradise)." And buttons flew in all directions.

—"Spike" says that he will not attend the World's Fair this year as he has secured a light job in Michigan. He has hired out for two months to wheel smoke out of a round-house; and this led the "blonde" to remark that he was going to separate saw-dust in a saw-mill for a summer's job.

—The four-oared crew of the *Montmorency* was organized this week, and the following are the positions assigned: Captain and Coxswain, R. Healy; C. Roby, No. 4; F. Hesse, No. 3. W. Covert, No. 2; N. Dinkel, No. 1. They have had the boat out during the past week, and feel confident that their adversaries will have a hard task to pass them.

—Thursday afternoon one empty Carroll campus showed that the "fever" had been suffered to "calm down." A great inequality was noticed in all the scores: (1) Captain Losier 27 *vs.* Captain Fossick 15; (2) Captain Lohner 22 *vs.* Yeager 6; (3) Anti-specials 19 *vs.* "Good Enoughs" 4; (4) Pickwicks defeated by Minims, 22 to 19. Strausheim knocked a home run.

—Our friend John, who has been very quiet for a long time, rises to the occasion, and asks: "Why do we hear so much about 'high noon' while nothing is ever said about 'low noon'? Can it be that matrimonial connections, or incidentals, are solely responsible for the expression; or are persons inclined to be "high" at noon or—what?" We think, John, that's *what's* the matter.

—Last Sunday, the St. Joseph's Hall boys organized a base-ball club, for the coming season. Captain of the *Blues*, Thomas Falvey; of the *Reds*, William McCreary; Francis Onzon, captain of the *Special* team. In the afternoon, a highly interesting game of ball was witnessed on St. Joseph's Campus. Following is the

Score by Innings:—	1	2	3	4	5	6	7	8	9	
Blues:—	0	1	0	0	0	2	0	1	1	=5
Reds:—	1	0	0	0	0	1	0	0	1	=3

—The Hon. W. P. Breen, '76, one of the leading lawyers of Ft. Wayne, Ind., has been making a very pleasant visit to his *Alma Mater* during the past few days. Of all Notre Dame's alumni none is assured of a more hearty welcome than Mr. Breen, whose visits are always most agreeable to the scores of friends whom he has made for himself by his genial good-nature and the many qualities of his gifted mind. We are glad to hear of the constant and well-merited success which is attending him in the practice of his profession.

—The spring meeting of the Notre Dame Athletic Association, held in the Brownson reading-room Thursday afternoon was well attended, and great interest was manifested in the election of officers for the ensuing session. Bro. Paul acted as temporary chairman and M. McFadden, Secretary. After the reports of the Secretary and Treasurer were read, the election of officers took place, and resulted as follows: Directors, Rev. Mr. Burns and Bro. Paul; President, Col. Wm. L. Hoynes; Vice-President, F. Chute; Recording Secretary, M. McFadden; Field Reporter, J. Henley; Captain of "Specials" M. Hannin; Captains of First Nines, W. Covert, and C. Roby; Captains of Second Nines, J. Brady, and V. Magnus; Property Man, Tim Smith.

—The attention of the students is called to Prof. Egan's new book, "A Gentleman," just published by Benziger Bros. They will find it one of the most useful and practical little books with which they should become familiar. It is intended to develop in the reader a taste for literature, which the author considers necessary in order to cultivate a proper standard of intellectual excellence. It also deals with good manners, proper forms to be used in writing, and styles to be followed in correct composition. The author relates many anecdotes of his literary work, some of which are of an amusing character, but at the same time present a realistic and practical view of literary life. He considers Shakspere the greatest of all writers, but thinks the student should pay attention to the standard writers of other lands. The student will find in Prof. Egan's work much to supplement and thoroughly impress upon the mind the teachings of the class-room.

—We take pleasure in reproducing the following from our esteemed fellow college journal, the *Owl*, of Ottawa (Ontario) college:

"'Shakspere's Religion,' an article of real literary merit, appears in the NOTRE DAME SCHOLASTIC. This effort, coming as it does from a member of the class of '94, undoubtedly merits congratulation. He is possessed of a nice power of discernment, and seems to be quite familiar with the weighty thoughts and unexcelled ideals which have originated in Shakspere's transcendent mind. He thus concludes his interesting article: 'A Catholic will recognize the spirit that glows in Shakspere's works. As a brother in religion, he cannot disown him whose imagination soars on high overlooking with eagle eye vast regions, and preferring to be Catholic in occasions, subjects, sentiments, allusions and times. Besides this, he reminds of his doctrines, ceremonies and rites, and his friars and priests as venerable and holy men. Shakspere's philosophy does not bear the stamp of the Reformation; for he knows no other philosophy than that based on reason guided by revelation, which, through the Catholic catechism, had become the common property of all; it contrasts with the notions of the Reformers as the green foliage with the withered leaves.'"

—Monday afternoon the Carroll Specials crossed bats with a South Bend Team. At first our boys were cautious, but they soon felt Cassidy's strength, as two home-runs testified. The score was:

CARROLL HALL.	1	2	3	4	5	6	7	8	9	Total
O'Neill, c.	1		0	0		1	0			2
Gilbert, 3d	1	0	1	0		1		0		3
Kutina, p.	1	0	1	1		0		0		3
Brown, 1st	1	0	1	1		1		0		4
Sweet, 2d	1		1	l. b.		0			0	2
Hack, r. f.	0		2	0		1			0	3
Rend, s. s.	0		2		0	0			0	2
Carney, l. f.	l. b.		1		0		0			1
Martin, c. f.	l. b.	0	1		0		0			1
Total.	5	0	10	2	0	4	0	0	0	21

SOUTH BEND.	1	2	3	4	5	6	7	8	9	Total
Judie,	l. b.		0		0		l. b.		1	1
Bourdan,	0		0			1	0		1	2
Johnson,	0			0		0		0	0	0
Welkes,	0			0		1		0		1
Taylor,		0	l. b.			0		1		1
Cassidy,		0		0		0		l. f.	0	0
McNabb,	l. b.				0		1	l. f.	0	1
Bevous,		0			0		0	l. f.		0
Kutcher,			0		l. f.		0	0		0
Total.	0	0	0	0	0	2	1	1	2	6

2 Base Hits: Gilbert, Carney, Kutina; *3 Base Hits:* Brown, Sweet, Hack; *Home Runs:* Hack, Gilbert.

Roll of Honor.

SORIN HALL.

Messrs. Ahlrichs, Bolton, Brown, Correll, Sinnott, Combe, Coady, Crawley, Chute, Dacy, Dechant, DuBrul, Flannery, Flannigan, J. Fitzgerald, C. Fitzgerald, Thorn, Kearney, Kunert, Maurus, Monarch,* J. McKee, F. McKee, Mitchell, McCarrick, Neef, Powers, M. Quinlan, Ragan, C. Scherrer, E. Scherrer, Schillo, Schaack, R. Schopp.

BROWNSON HALL.

Messrs. Barton, Beck, Brennen, Burns, Brady, Brinen, Bennett, A. Corry, Colby, Cooke, R. Corcoran, Casey, Chidester, Cherheart, Croxton, Devanney, Donahoe, Dinkel, Dillon, Eyke, Foley, R. Flynn, Feeney, Freytag, E. Flynn, J. Flynn, F. Hoffman, J. Hoffman, Hoepe, Healy, Harris, Hagan, Henley, Hudson, Heneberry, Hodge, Jacobs, Jordan, M. Kirby, W. Kennedy, Kearns, Krembs, Kintzele, Kilkenny, Karasynski, J. Kennedy, Leonard, Libert, Laux, Murray, McCuddy, D. Murphy, Meibers, McCullough, Moxley, McVean, F. Murphy, E. Marckhoff, R. Marckhoff, McCarthy, Magnus McGarry, O'Connor, O'Shea, Pulskamp, Prichard, Patier, Quinlan, Rice, C. Roby, G. Ryan, M. Ryan, E. Roby, Reis, Stanton, Smith, Stace, Tinnen, Vignos, Walker, Wilkin, Welsh.

CARROLL HALL.

Messrs. Bergland, Barrett, R. E. Brown, O. Brown, J. Brown, Bennett, Berles, Blumenthal, Bachrach, Bixby, Baldauf, Burns, Brennan, Bacon, Covert, Cornell, Carter, Chauvet, Clendenin, Connell, A. Coolidge, Cavanagh, Cullen, Carney, Dorsey, Dion, Druecker, Ducey, Dannemiller, Dillman, Dempsey, Dixon, DeLormier, Dutt, Franke, Fossick, Finnerty, Ford, E. Gilbert, G. Gilbert, L. Gibson, N. Gibson, Gerding, Gonzales, Gerdes, Hack, H. Hill, Hoban, D. Hilger, Heizman, Howell, Janssen, Jones, Krollman, A. Kegler, W. Kegler, Kutina, Kelliher, Kindler, Klees, G. Lee, J. LaMoure, W. LaMoure, Lambka, Lantry, Lohner, Lawler, Langevin, G. Lowrey, T. Lowrey, Loser, Louie, Ludwig, Lynch, Lippman, M. Lee, H. Martin, Maurer, Mitchell, Maternes, Maguire, E. Murphy, L. Murphy, L. Miller, Mengis, Mills, Marr, Miles, Moss, Monaghan, C. Meyers, R. Miers, S. McDonald, McCarrick, J. J. McPhillips, J. McPhillips, C. McPhillips, E. McDonald, Nolan, Nichols, O'Mara, F. O'Brien, Oliver, Pim, Reis, Rumely, Rend, Ruppe, Repscher, Romero, Reber, Roesing, J. Rozynek, P. Rozynek, Sievers, Sweet, W. Spalding, S. Spalding, Slevin, Spiegel, Sullivan, Schaack, Sparks, Segenfelter, Strauss, Sharp, Schroth, Shillington, Taylor, Trankle, Thome, Tempel, Treber, Thornton, Wolf, Wagner, Welty, Walker, H. Wilson, R. Wilson, Whitehead, Washburne, N. Weitzel, B. Weitzel, O. Wright, D. Wright, Yeager, A. Yglesia, L. Yglesia, York, C. Zoehrlaut.

ST. EDWARD'S HALL.

Masters Ahern, G. Abrahams, L. Abrahams, Bump, Ball, Bopp, Barrett, R. Berthelet, V. Berthelet, Brown, Christ, Curry, Corry, F. Campau, Corcoran, Cressey, J. Coquillard, A. Coquillard, Cross, Croke, Durand, Devine, Elliott, Eagle, W. Emerson, F. Emerson, Engelhardt, Egan, Finnerty, Freeman, Feltenstein, Girsch, Gavin, Green, Graff, Gifford, Howard, Higginson, Holbrook, Roy Higgins, Ral Higgins, J. Higgins, J. Healy, W. Healy, Ives, Jones, Johntry, Jonquet, Rilgallen, Keeler, Kinney, LaMoure, Loomis, Langley, Lowrey, Lysle, Lohner, Maritzen, A. Monaghan, C. Monaghan, Morris, McPhee, McGinley, McGushin, McAllister, McCorry, R. McCarthy, Minnigerode, E. McCarthy, Emmit McCarthy, McDonald, Ninneman, Otero, Oatman O'Neill, H. Pollitz, W. Pollitz, Peck, Pieser, Patterson, Pyle, L. Rasche, Roache, Roesing, Rohrbach, A. Romero, Robb, Ryer, W. Scherrer, G. Scherrer, Stuckart, Shillington, Segenfelter, Schneider, Shipp, Trankle, L. Thompson, U. Thompson, Wilcox, Wagner, Wells.

* Omitted by mistake last week.

[*From the London Electrical Review*].

Who Really Invented the Lightning-Rod?

We have it on the authority of Joseph J. Kral that Procopius Diwisch, a Catholic priest and professor of philosophy at the Lyceum of Luka in the early part of the eighteenth century, was the man who, before Franklin, discovered the identity of lightning and electricity, and the issuing of electricity from metallic points —two important truths which led him to construct a lightning conductor.

We learn that Procopius Diwisch (Dyiv'ish) was born on August 1, 1696, at Zamberk (Seuftenberg), in Northeastern Bohemia. In 1720 he took Holy Orders, and shortly afterward received the professorship of philosophy at Luka. He began to teach physics, with experimental demonstrations—a great innovation for those times. After a rather changeful career, during which he was Prior of the Lukan convent (1741), he became a parish priest, and settled down at Prendice to the study of electricity. His method of work was essentially experimental. Observations on thunder-storms soon led him to the discovery that lightning was but an electric spark. How thorough his studies were may be gathered from the fact that he worked out a complete theory of atmospheric electricity, a treatise on which was published from his papers after his death. This was entitled "Laengst Verlangte Theorie der Meteorologischen Electricitaet," Tubingen, 1768.

Another important discovery followed soon after. Diwisch found out that "metallic points would both attract and discharge electricity more speedily than anything else," and he proceeded to make a practical application of the newly discovered truth. About the same time Franklin was receiving his first lessons in electricity from Dr. Spence.

Unusually prompt recognition of his services waited upon Diwisch. The Emperor Francis Stephen invited him to repeat his experiments before him and the Empress Maria Theresa, and rewarded him with two gold medals.

In 1753, Prof. Richman, of St. Petersburg, while observing a storm from a hut, was killed by lightning descending an insulated iron bar specially erected for the purposes of the investigation. Upon learning of the fate of that martyr of science, Diwisch drew up a memoir on the incident, and clearly showed how, in case of a storm, the danger of a lightning stroke could be averted by means of a conductor. This treatise he sent to the famous mathematician Euler, then president of the Berlin Academy of Science, asking for judgment. But the Academy failed to understand his reasoning. When Franklin's account of his discovery was read before the British Royal Society it was laughed at!

However, on June 15, 1754, Diwisch erected the first lightning-rod. The construction was as follows: A pointed slender iron bar formed the main portion of the conductor. Fastened to it were two cross bars, thus making four arms, across each of which, in turn, a shorter bar was laid. Each of the twelve extremities thus produced carried a box filled with iron filings, in which 27 brass needles were stuck, making 324 needles in all. The main bar was supported by a wooden column sufficiently high (48 feet at first, afterward 132 feet) to secure protection for the building and its immediate surroundings. Several iron chains connected the main bar with the earth. The effect of this apparatus was soon demonstrated, thunder-storms being frequent at Prendice.

For two years Diwisch continued experimenting with his lightning-rod, the results being published by Dr. Scrinci in the *Prague News* (1754). Having satisfied himself of its utility, Diwisch offered the emperor a plan for erecting a number of conductors; this plan was submitted to the Viennese mathematicians, who reported so unfavorably upon it, that it was never carried out. Abbot Marci, in a letter to Diwisch about this time, refers to the unfavorable attitude of these mathematicians, and tersely puts the whole position in one phrase—"Blasphemant quæ ignorant."

At last (1756) Diwisch was compelled to remove his lightning-rod. There had been a very dry summer that year, which the farmers of Prendice ascribed to the erection of the rod there. It was consequently removed and deposited at Bruck, where it has been kept to this day. With this treatment compare the action of the Boston clergyman, who, in 1770, preached against lightning-rods as "impious contrivances to prevent the execution of the wrath of heaven."

Thus Diwisch was prevented from perfecting his lightning conductor, and from seeing its adoption in his native land. After this episode he turned to music, and invented a new instrument, which he named "Denis d'or," and which was a kind of organ. He died Dec. 25, 1765.

Undoubtedly, Diwisch knew nothing of Franklin, and there is no evidence that Franklin ever heard of Diwisch; their discoveries in electricity were wholly independent of each other. But Franklin found a people who understood him —the French; while Diwisch, by reason of his social position, was prevented from developing his idea. Again, Benjamin Franklin was a public man, who stood conspicuously before three countries, while Procopius Diwisch was merely a parish priest of a small Bohemian village, with few connections.

An epitaph, written by one of Diwisch's contemporaries, wittily refers to the two inventions of this remarkable man:

> Ne laudate Jovem, gentes! quid vester Apollo?
> Iste magis deus est fulminis atque soni.

Which may be rendered—

> Do not praise Jove, nations! What is your Apollo?
> This man, rather, is a god of both the lightning and the sound.