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HYSTERIA AND YACHT RACING.

We regret to say that the sensational press is just now doing its very best to warrant the statement recently made in a foreign journal that we are a people much given to a form of popular hysteria.

We refer to the unwarranted—we had almost said cowardly—attack which has been made upon the managing owner of the American yacht "Columbia"; a gentleman who for the third time in the history of the cup has voluntarily undertaken the onerous labors and untold anxieties incident to the management of a cup defender.

Time and again has this distinguished yachtsman brought the American boat across the line, an easy victor over the challenging vessel; and the very journals that are now indulging in cheap sneers at his expense, were then the loudest in their praises of his untiring zeal, his executive ability, and his unquestioned skill as a yachtsman. Yet to-day we are told that his zeal is mere self-exploitation, his executive ability mere meddlesomeness, and that as a yachtsman he is crudely amateurish.

Now there is a cause for this sudden change of front, and the cause is not far to seek. It is to be found in the fact that the vanity of a certain minority (happily a very small one) in our midst has been cut to the quick by the fear that at last a challenging yacht has appeared off Sandy Hook that seems to their timorous souls to be just a bit better than our own; and in the chagrin occasioned by this discovery, the journals in question are venting their mortification upon the very people who should command at this crisis their warmest sympathy and support.

Such a spirit is pitiful to contemplate even in the abstract; but when it is so shameless as to flaunt itself in printer's ink upon column after column of a metropolitan paper, it may well bring a blush of shame to the cheek of every citizen and sportsman who has the fair name of his country at heart.

Mr. Iselin and the gentlemen associated with him in the management of "Columbia," are every bit as good yachtsmen when sailing a defeated "Columbia" as a victorious "Defender" or "Vigilant." In the name of good sportsmanship and common decency, then, let us have done with a show of petulance and bad temper, which befits more the kindergarten or the nursery than the public discussion of the greatest sporting event of the nineteenth century.

LIQUID AIR PROMOTING.

Somebody once made a statement to the effect that where the carcass is there will the vultures be gathered together. Though the speaker had in his mind a far different event from the liquid air craze of the year 1899, and the liquid air fallacy that was to be killed as soon as it was hatched, the interpreter of the prophecy might be excused for thinking that in the sudden swoop that has been made by the company-promoting vulture upon the liquid air carcass, he beheld a veritable fulfilment of the prediction.

For the protection of the public, we wish to enter an earnest protest against the commercial exploitation of comparatively untried inventions of which so much is going on in various parts of the country. The most flagrant examples of this sort of thing just now are to be found in the starting of companies and the selling of stock for the promotion of liquid air schemes of more or less, and generally more than less, preposterous pretentions. We do not say that any of these are deliberate attempts to obtain money falsely, but we do say that the crude nature of the liquid air apparatus, whether it be in the form of motor, refrigerator, explosive or whatnot, the absence of any demonstrated facts to establish its value, and the utter fallacy of the theories upon which the successful operation of many of these devices depend—render it our duty to warn the readers of the SCIENTIFIC AMERICAN against investing their money in enterprises which exist only in the imagination of their promoters.

We were recently consulted by correspondents with regard to the wisdom of investing in one of the most audacious of these enterprises, which has its headquarters in the city of Boston and boasts of a modest capitalization of $5,000,000. We made it our business, accordingly, to ascertain by correspondence and personal inspection just what kind of liquid air motors and plant for the manipulation of the same, the company possessed; but after the exchange of several letters and a visit by a representative of the SCIENTIFIC AMERICAN to the headquarters of the company we have failed to find either a motor, or a plant for the manufacture of the same, which would justify the Liquid Air, Power and Automobile Company in asking the public to put a single penny in its coffers.

We have at hand the explanatory pamphlet which was furnished us, at our request, by the company. We give a few quotations from this surpassing document, the opening sentence of which is a gem that needs no setting of the editorial pen: "Steam and electricity, giants both as they are, have had their day." Rivaling it in brilliance is the statement that "their fields were and are limited when compared with the transcendant possibilities of liquid air, whose power is not only on the earth but above it and beneath the sea as well." Of course the L. A. P. and A. Company has patents, and the fact is suggested as follows: "But now, with the inventions of George Code, Hans Knudson, and Milton Chase to control and apply it (liquid air) as a motive power, its possibilities of usefulness and profit admit no bounds less than those of the firmament above!"

The description of the glories of the new motor culminates in a burst of triumph with the statement, "the power transmitter *enables us to secure five horse power from two.*" In the endeavor to warn the public against investment in a scheme of such grotesquely absurd pretensions, we cannot do better than allow the last quotation to stand without comment.

THE "DENVER" CLASS OF CRUISERS.

According to a report from Washington, a test has been made in the experimental towing basin which gives reason to believe that the new 3,500-ton semi-protected cruisers, if built, would attain a speed of 17 knots with 4,500 horse power. The specifications of these vessels call for a speed of 16½ knots, with the provision that if the speed on trial falls below this figure the ship will be accepted at a reduction of $25,000 for every quarter knot to 16 knots, and a reduction of $50,000 for every quarter knot between 16 and 15½ knots. It is stated in the report that these towing-tank experiments prove that shipbuilders who are intending to bid upon the plans for these vessels need have no fear that the ships will not fulfil the requirements as to speed.

The SCIENTIFIC AMERICAN has already criticized these cruisers as being of a type that is altogether out of date, and for most of the purposes of modern warfare practically useless. For the work that they are supposed to do they will be at least 3 knots too slow, even if they should reach, as the towing-tank experiments suggest, a speed of 17 knots an hour. We are free to confess that this discussion as to whether our new cruisers are to make 16½ or 17 knots is a waste of time and words in this late day in the development of the fighting ship. It would have been timely in the late seventies and early eighties, when we were considering the plans of the old 16-knot "Atlanta" and "Boston"; but the fact that in this age of 19-knot battleships and 22-knot armored cruisers, the first use to which our new towing tank is put is the testing of 15½ to 16½-knot half-protected cruisers, is positively humiliating.

Not merely in respect of speed, but as regards their armor and armament, these ships, by the time they are launched, will be at least eighteen years behind the times. We speak advisedly and "by the book," as a comparison with the first ship that was constructed of the protected cruiser type will show. This was the "Esmeralda," built in 1883 for the Chilian navy, purchased from that country in 1895 by Japan, and now known as the "Idzumi." This famous craft was the prototype of the modern, high-speed, protected cruiser, and as such she forms an admirable foil to set off the advance which has been made in the intervening years since she was launched. In view of the fact that the new cruisers, if they are ever built, will not be launched before the year 1901, the interval between the "Denver" and her prototype will amount to eighteen years. Let us see, then, from the following table, what advance has been made in that period, as judged by the proposed cruisers.

	"Esmeralda." 1883.	"Denver." 1901.
Displacement	2,950 tons	3,500 tons
Speed	18·3 knots	16·5 knots
Horse power	6,080	4,500
Coal supply	600 tons	700 tons
Officers and men	300	290
Main battery	Two 10-inch B. L rifles, Six 6 inch B. L. rifles	Ten 5-inch rapid-fire guns
Protective deck	1-inch complete	*None
Torpedo tubes	3	None

*Strip of 2-inch armor for one-third of the length amidships.

The comparison is, to say the least, profoundly discouraging. Here we have a vessel 550 tons larger than her eighteen year old prototype, that has 2 knots less speed, over 1,500 less horse power, is less completely protected, mounts a less powerful battery and fewer men to fight it, and that carries not a single torpedo tube as against three in the smaller ship!

Nor can those who are responsible for foisting a whole fleet of inferior ships upon the country evade the force of this comparison by claiming that the "Esmeralda" was a "show-window vessel," built for the trade, and unable to stand the hard knocks of actual service; for after a dozen years in the Chilian navy, during which she went creditably through the Chili-Peru war, she was considered sufficiently valuable by Japan to be purchased and placed on the active list of their navy.

We are correct in stating that nine-tenths of the naval constructors are opposed to the proposed cruisers, just as they were opposed to the construction of the six composite gunboats of the "Annapolis" and "Princeton" class which, but for the accident of the Spanish and Philippine wars, would have been useless for the duties of the American navy. The public is asking why these six obsolete vessels were ever proposed, much less authorized. Perhaps the Congressional Committees on Naval Affairs, who are responsible for the fiasco, can explain.

A TIMELY REBUKE.

We note that in a recent issue The Practical Engineer, of London, administers a stinging and richly deserved rebuke to that section of the English press which has been giving vent to its mortification over the American invasion of British trade by a tirade of abuse and misrepresention which would do credit to the columns of the ripest yellow journalism. Referring to the suggestions of inferior workmanship which have been made regarding the Atbara bridge, in the Soudan, our contemporary says: "It is deeply regretable to notice the tone assumed by some of the London journals, whose observations upon the subject are not only in extremely bad taste, but are, furthermore, in many cases ridiculous, and only calculated to show the utter ignorance of the writers upon the subject which they are dealing with. Moreover, they are such as must inevitably bring contempt upon the engineeriug community of this country, by whom they cannot be too promptly or too strenuously repudiated."

The distinction between the technical and the non-technical press is well made, for the tone of the one has been as intelligent and just as that of the other has been ignorant and unfair. "Engineering," speaking through its accomplished editor, who, by the way, is almost as well known on this as on the other side of the Atlantic, has ever been marked by a generous appreciation of the rapid advance made by the United States in the engineering industries during the past two decades, and even "The Engineer" has, of late years, abandoned its ungenerous attitude and has warned its readers that Englishmen were being beaten by America in some of their most important lines of work.

The London daily press, with a few notable exceptions, has always been the nursery of all that is ultra jingoistic and pseudo-patriotic in Great Britain, and there is a danger lest its late hysterical outburst over the Egyptian bridge and the Midland locomotives should be mistaken by the American people for a true expression of the attitude of the mass of the English people or the journals that provide them with technical literature. As a matter of fact, the latter have proved to be thoroughly awake to the serious nature of American competition, and have shown a full appreciation both of the superiority of American methods and the faults of their own.

GOVERNMENT ADVERTISING IN FRANCE.

The national debt of France is constantly on the increase, and apparently they have at last decided to go into advertising as a means of making money. This method has already been used to a considerable extent by various municipalities which have sold the space on certain public buildings to advertisers as the panels of city railway cars are disposed of in the United States. Now, however, the railway stations, police stations, custom houses, barracks, and other public buildings which are entirely under the control of the government are to be used to some extent for advertising purposes. The value of this space for advertising purposes is greatly enhanced by legal restrictions on the owners of private property which prevents the sale of space for similar purposes. The government has also introduced another advertising enterprise, which is the "lettre annonces" or advertising postpaid letter sheet. Half a sheet of ordinary letter size paper of rather poor quality is devoted to advertising except a space reserved for the address and a 15 centimes postal frank is printed upon it. The letter is written on theother half of the sheet, which is ingeniously folded and held by a gummed flap. The whole affair is sold for 10 centimes, that is, two-thirds of the price of single letter postage or exactly the same as a postal card. The

purchasers therefore, saves one-third of the postage, and gets his paper-envelope and the privacy of his correspondence for nothing. The scheme is worked by a corporation which is practically a government enterprise. While the sale of the postal cards and postage stamps will probably be decreased by this means, the receipts from advertising will enable the government to make a substantial profit out of the project.

THE DEFECTIVE EYESIGHT OF SCHOOL CHILDREN.*

BY ARCHELAUS G. FIELD, M.D.

Defective eyesight among school children has been and still is a subject of much concern.

The abnormal condition largely in excess of all others as shown by statistical reports in general is myopia or short sightedness.

In his report of investigations of the subject more than thirty years ago, Cohn shows after examining the eyes of ten thousand school children that there were in the elementary departments about two per cent with defective vision from this cause; in the intermediate departments about eight per cent; in the high school fifteen per cent; and in the gymnasium twenty-six per cent. It will be noticed that these figures indicate an approximation to a regular ratio of increase from the lower to the higher grades. More recent statistics show an increase since that time of from twenty-five to fifty per cent in the higher German schools. While Germany leads the world in the intensity and persistence of school life, she also leads it in the percentage of myopics. Statistics show that the same conditions prevail in every other educational country in very near proportion to the devotion to school work. The causes assigned are first, "bad" light; second, bad air; third, inheritance; fourth, unnatural position; fifth, using the eyes during partial congestion of the blood vessels of the brain; sixth, general debility; seventh, using the eyes upon fine print or in too near proximity. These causes are all more or less amenable to remedies, and it is fair to assume that the suggestions have been adopted in the sanitary management of schools. If so, we are confronted at this stage of the inquiry by two propositions, first, that the importance of the subject has been fully appreciated, and second, that the prevalence of the defect has not decreased. Cohn placed as first in the list of causes "bad," meaning dim light, and the same prominencehas been given to this cause by most writers and teachers down to the present time. He recommended the construction of school houses with one square foot of glass area to every two feet of floor space, Modern school houses are constructed with a view to flooding them with light. Such provisions should all be utilized on dark days. But the flood of light on bright days is responsible, associated as it is with near vision for the prevalence and increase of myopia. With the better provisions for lighting modern school houses the care and responsibility of properly regulating the light increases.

While collecting material for this paper the writer visited, and from measurements, estimated the proportion of glass area to floor space of more than forty school rooms. The variation in view of the fact that they were all constructed for the same purpose was very striking running all the way from 1 to 4, or 1 to 20. While the light in the latter is none too strong to be used by scholars in their ordinary work on dark days, and can be sufficiently shaded for bright days, the light of the former cannot be made sufficient for any but the brightest days.

It is doubtful if any human eye can be habitually employed in near vision on ordinary print in such strong light as is afforded by 1 to 4 or 1 to 6, without producing permanent and irreparable myopia. All of the rooms visited were provided with some sort of window shades or shutters, and there was some pretence at using them, but in the absence of any guideother than the sensations of the teacher the benefits were spasmodic and insufficient. This brings us to the single object of this paper, viz., the necessity for the most systematic and efficient regulation of light, and constructive provisions for lighting. Most rooms are lighted from windows on one side, or on one side and one end. No such room can be approximated to uniformity in lighting. The seats nearest the windows may have light equal to 1 to 2, while the distant seats may have light equal only to 1 to 15 or 1 to 20, and the respective scholars are placed at corresponding disadvantage. While much has been done to improve the architecture and convenience of modern school houses in some respects it is doubtful if many of them surpass in evenness of light, the old log school house of former times with two or three windows upon each of two opposite sides. The accommodative apparatus of the normal eye adapts its optical parts to a wide range of external conditions, but too long continued or over worked it becomes disabled. This is precisely what happens to produce most visual defects in the school room. Every one knows that when a double convex lens such as is the crystaline lens is focused upon a near object, the back focus recedes. In other words, the change of one of the conjugate foci changes the other. On the same principle in near vision the image falls too far back for the posterior wall of the retina, and to secure sharp vision the distance between the lens and posterior wall of the retina must be increased. This is accomplished by the accommodative apparatus.

The contraction of the celiary muscle increases the convexity of the lens to shorten its focal distance and at the same time moves it slightly forward, while the probability is that the two oblique muscles, grasping the eyeball upon either side and acting against each other, compress the eyeball laterally, thus elongating its anterio-posterior diameter and increasing the distance between the lens and posterior wall of the retina. Whatever may be thought of this explanation, it cannot be denied that elongations of the eyeball is the pathological condition in uncomplicated myopia, and that such elongation must, of necessity, have resulted from the action of the accommodative apparatus.

Again, the stimulus of bright light contracts the iris, reducing the pupil, and shutting off the peripheral rays. The central rays, which are brought to a focus further away, become the visual rays, and again the image is formed too far back for the posterior wall of the retina. The action of the accommodative apparatus in securing sharp vision is precisely what it was in the case of near vision, and again the result is temporary myopia. This may also be demonstrated by the use of a large and then a small stop before the same double convex lens, the image falling further back as the size of the stop is reduced.

In school life we have these two causes acting singly and also conjointly to produce the myopic condition, and being continued too long, overcomes the natural elasticity and recuperative energy of the accommodative apparatus, resulting in chronic, permanent and incurable myopia.

The remedies are obvious:

1. Provision for uniformity of light and impartial seating of pupils, by placing windows on two opposite sides at least of the school room.

2. Every window, more especially those exposed to direct sunlight, should be provided with two shades of different density, both lowering or opening from the top of the window.

3. The maintenance, approximately, of a uniform standard of light, presumably that represented by one square foot of glass to twelve or fifteen of floor space on bright days.

Some attention would be required, but if the great army of myopices constantly emerging from the schools and colleges can be thereby reduced the trouble will be well rewarded.

*Read at the Columbus meeting, 1899, of the American Association for the Advancement of Science.

THE BOERS AND THE GIRAFFE.

The Boers are credited with being great hunters, and chief of them in his younger days was President Kruger, whose daring in attacking a lion single-handed, with a hunting knife, as has many times been told. When the Boers migrated from Cape Colony to the Transvaal they were forced to clear the way by killing 6,000 lions, many of which were killed by Kruger. For years the South African Boers have been hunters, and their skill with the rifle is due to this daily practice in the fields and woods. But with them the killing of game has been either a matter of dollars and cents or self-protection.

Their creditable work of freeing South Africa of the dreaded lions, which roamed in such numbers that life was rendered unsafe anywhere in the country, is offset by their ruthless destruction of the giraffe from Cape Colony to the Botletli River. If they killed 6,000 lions in the Transvaal before existence was made safe, they may have killed 60,000 of the innocent, graceful giraffes. In the early days of South African history the giraffe was the most abundant game in the Transvaal, Matabeland, and Orange Free State, but the creature has been killed off like our American buffalo, and the few remaining representatives of a noble race gradually driven north. For years past the giraffe has been a profitable quarry for the Boer hunters, and the animal was valued by them only because the hides were articles of commercial use. They were pot-hunted, shot down in droves, and destroyed in the greatest number possible in every direction. The extinction of the animal in South Africa is now threatened, and its preservation by legislation comes when it is almost too late. In this respect, too, the brief history of the creature will resemble the story of our buffalo.

A good giraffe skin is worth from $10 to $20 in South Africa to-day, and much more in Europe. On their hunting trips ten and fifteen years ago it was a common matter for one hunter to kill forty and fifty of these graceful animals in one day. The reason for this is that the giraffe is the most innocent of animals, and easily hunted. They are absolutely defenceless, and there is hardly a case on record where a wounded giraffe turned upon the hunter. It is true they have great powers of speed, and they can dodge rapidly from tree to tree in the woods, but they offer such a fair mark that these tactics hardly ever save them. Not until unusually frightened does the giraffe make its best speed, and then it is often too late, for the hunter is upon it. There is really no elemant of danger connected with this sport, and that makes it less exciting and attractive to a true sportsmen. Under certain circumstances it is possible to be injured with the powerful legs of the giraffe, which are capable of kicking a blow that would kill a lion. This latter beast for this reason takes good care to attack the giraffe at unexpected moments.

It takes a good horse to run down a giraffe, and if the least advantage is permitted the wild creature the race is lost. Its peculiar gait is very ungraceful and deceptive, but it covers the ground with remarkable facility. In the open veldt the hunters always have the best of the race, but the giraffe when surprised makes instantly for the forest where tough vines and intermingling branches make travels difficult for the hunter. The bushes and thorns tear and lacerate the skin of the horses, but the tough skin of the giraffe is barely scratched. The creature will tear a path through the toughest and thickest jungle, and never suffer in the least.

This skin or hide of the animal is its chief article of value. No wonder that the bullets often fail to penetrate this skin, for it is from three-quarters to an inch thick, and as tough as it is thick. This skin when cured and tanned makes excellent leather for certain purposes. The Boers make riding whips and sandals out of the skins they do not send to Europe. The bones of the giraffe have also a commercial value. The leg bones are solid instead of hollow, and in Europe they are in great demand for manufacturing buttons and other bone articles. The tendons of the giraffe are so strong that they will sustain an enormous dead weight, which gives to them pecuniary value.

The extinction of the giraffe in South Africa is to be deplored, because the animal is peculiarly adapted to the wilderness of forest and veldt, where it feeds on the giraffe acacia that nature seems to have raised specially for it.

G. E. W.

VITRIFIED CLAYPIPE INSTEAD OF IRON FOR GAS MAINS.

The idea of using vitrified claypipe instead of iron was proposed to Irvin Butterworth by Henry L. Doherty, President of the Madison (Wisconsin) Gas and Electric Company. The former read a paper upon it at the Western Gas Association meeting at Milwaukee. The suitability of vitrified claypipe for gas mains is due to their cheapness, durability, strength, non-susceptibility to electrolytical action, slight susceptibility to changes of temperature, non-porosity, adaptability to the making of service connections by the use of special or small auxiliary distributing pipes of wrought iron. Vitrified claypipe should, of course, be selected and laid with the same care which is given to the laying of cast iron mains. The possibilities for the reduction of the construction accounts of gas companies by the use of vitrified claypipes instead of iron for gas mains seems too great and promising to be despised.

AMERICAN STEEL FOR A PRINCE'S PALACE.

The Imperial architect of the Japanese government has placed orders with the Chicago Steel Company for several thousand tons of structural iron and steel to be used in the construction of a palace for the Crown Prince of Japan at Tokio. The palace is to be 400×300 feet and three stories high, to be constructed specially with a view of withstanding earthquake shocks. The general plans includes, says The Railway Review, a system of bracing connecting all of the columns below the basement floor, the whole system to be imbedded in concrete. Under the roof on the line of the bottom chord there is to be another system of heavy bracing connecting all of the columns. The object of this unique structural design is to get a framework which will move as a whole in case it is disturbed by the force of an upheaval. There will be an open colonnade in front with heavy columns and a broad staircase up to the entrance. The exterior is to be built of Japanese granite.

A LONG PHOTOGRAPHIC TELESCOPE.

Last spring a plan was proposed at the Harvard College Observatory for the construction of a telescope of unusual length for photographing the stars and planets. Anonymous donors have now furnished the means by which this experiment may be tried. The plan will, therefore, take definite shape, and it is expected that a telescope having an aperture of 12 inches and a length of 100 feet or more will be ready for trial at Cambridge in a few weeks.

EDWARD C. PICKERING.

THE method of making sheet lead for tea packing in Formosa is most interesting. The lead is brought from Australia in pigs and after being melted is poured between two large tiles, the required degree of thickness for the sheet being obtained by pressure by the feet. The sheet is afterward trimmed to suitable sizes and shapes for soldering.