CIGARETTES AND SCIENCE.

BY JOHN WALLACE

The recent papers on "The Cigarette Question," read before the Medico-Legal Society of New York, deserve more than passing notice. And this claim to consideration is chiefly because of the curious side light which their treatment in the lay press throughout the country has revealed.

To those accustomed to the methods of science and of scientific modes of thought, it is axiomatic that investigation and demonstration must always be conditions precedent to accurate and defensible conclusions.

In the mind of the average layman this is obviously not the case, as a brief resumé of "The Cigarette Question" will show.

Here are the facts. An article of commerce called a "cigarette" is placed on the market to the extent of 4,000,000,000 annually. Allegations are made, through the media of tracts and the public press, by persons apparently disinterested, that this article of commerce is a menace to the health of the community, because; —

(A) It contains, either in the fillers or in the paper wrappers, opium, morphine, jimpson weed, belladonna, glycerine, sugar, arsenic, phosphorus, chlorine, copper, creosote, saltpeter, valerian, cannabis indica, cocaine and other "appetite kindling drugs." (This list is compiled from a municipal ordinance passed by the City Council of Chicago and from a tract.)

(B) It produces insanity. (This statement appears in a petition to Congress; in the tract cited above; and in the headlines of journals throughout the country.)

No more serious accusations than these could be made against any commodity purchasable in the open market. If true, the fact that a single cigarette may be bought without the criminal prosecution of both manufacturer and retailer is evidence of appalling laxity on the part of public officials; if false, the fact that such opinions find lodgment in otherwise intelligent minds is evidence of appalling indolence and ignorance.

It is so simple to ascertain the truth. Investigate the ingredients by means or chemistry as to (A) and obtain the verdict of insanity experts of repute and experience as to (B). The conclusion must be in accordance with the verdicts rendered by these two classes of scientific experts, and cannot be gainsaid.

The Medico Legal Society did this. In November, W. H. Garrison read "A Brief for the Cigarette," and at the February meeting Clark Bell, secretary of the society, read a paper on "The Cigarette Question."

Mr. Garrison in his paper quoted eminent analysts of this country and of Europe to show that no trace of anything except pure tobacco and pure paper entered into the composition of American cigarettes. The verdict of these chemists was unanimous and therefore conclusive.

Mr. Bell, as a part of his contribution to the literature of this subject, read letter after letter from neurologists, alienists and superintendents of insane asylums, to the effect that cigarettes had never caused insanity.

Following Mr. Garrison's paper, The New York Sun printed an extended report of the paper, under the caption "Cigarettes Defended." Mr. Bell's paper was reported in The New York Tribune, with the headline "Cigarettes 'Not Guilty.'"

In these headlines lies the lesson. The lay mind had so entirely absorbed the idea of the noxiousness of the cigarette that the scientific results, so easily obtainable at any time, were actually "news," and dignified by headings such be used to announce the important discovery of something new to science.

The age is proud of calling itself "scientific," but while opinions so wholly erroneous may be commonly held to such an extent that the bare announcement of their absurdity is held to be "news" worth printing, we are a long way from justifying ourselves in the application of the word "scientific" in any real sense of the word.

Business and Personal.

The charge for insertion under this head is One Dollar a line for each insertion; about eight words to a line. Advertisements must be received at publication office as early as Thursday morning to appear in the following week's issue.

NEW BOOKS, ETC.

L'ANNEE INDUSTRIELLE. Paris: Juven & Company. 1897. Pp. 330. 12mo Price 75 cents.

The progress in the year 1897 is supposed to be summed up in the present volume, which will probably prove of some value to those who take a popular rather than professional interest in the engineering and scientific progress of the year. Many of the illustrations are perfect caricatures and give an entirely wrong opinion of affairs, specially as regards America. The illustrations on pages 4 and 73 are ridiculous. A large number of the illustrations have no reference whatever to the year which has passed. We are glad to see that the articles taken from foreign sources are in the main properly credited. This is a point upon which our transatlantic brethren seem to have little conscience.

The first two numbers of The Journal of Applied Microscopy have appeared. It is published by the Bausch & Lomb Optical Company, of Rochester. It cannot, however, be considered in any sense a trade publication. For a long time there has been room for a new journal of microscopy on rather different lines than those already in the field. So we are glad to welcome the advent of the new journal, which will certainly prove very useful. Great attention will be given to microscopical instruments and technique viewed from a practical standpoint. The February number contains a splendidly illustrated article on the laboratories of microscopy, histology, bacteriology and pathology of Cornell University. It is edited by L. B. Elliott, and the subscription price is $1 per annum.

In the Marine Review, of Cleveland, Ohio, of recent date, is an annual report of shipbuilding in all parts of the United States. It is a handsome double number with two coated paper supplements giving portraits of the officers of the society, naval architects and marine engineers and shipbuilders. This special number is mailed on receipt of twenty cents by the publishers.

Notes & Queries

HINTS TO CORRESPONDENTS.

Names and Address must accompany all letters or no attention will be paid thereto. This is for our information and not for publication.

References to former articles or answers should give date of paper and page or number of question.

Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department. each must take his turn.

Buyers wishing to purchase any article not advertised in our columns will be furnished with addresses of houses manufacturing or carrying the same.

Special Written Information on matters of personal rather than general interest cannot be expected without remuneration.

Scientific American Supplements referred to may be had at the office. Price 10 cents each.

Books referred to promptly supplied on receipt of price.

Minerals sent for examination should be distinctly marked or labeled.

(7372) W. H. H. says: Will you be kind enough to give me a receipt for the wax used by laundrymen on their irons? They also put some of it in their starch. A. Glossed Shirt Bosoms.—Take 2 ounces of fine white gum arabic powder, put it in a pitcher and pour on a pint or more of water, and then, having covered it, let it stand all night. In the morning, pour it carefully from the dregs into a clean bottle, cork and keep it for use. A teaspoonful of gum water stirred in a pint of starch, made in the usual way, will give to lawns, white or printed, a look of newness, when nothing else can restore them, after they have been washed. Or, melt 2½ pounds of the very best A1 paraffin wax over a slow fire. When liquefied, remove from the fire and stir in 100 drops oil of citronella. Have some new round pie tins; place them on a level table, coat them slightly with sweet oil, and pour about six tablespoonfuls of the enamel into each tin. The pan may be floated in water to cool the contents sufficiently to permit the mixture to be cut or stamped out with a tin cutter into small cakes about the size of a peppermint lozenge. Two of these cakes added to each pint of starch will cause the smoothing iron to impart the finest possible finish to muslin or linen, besides perfuming the clothes.

(7373) L. G. S. asks: 1. About how many volts is required to run a ¼ horse power motor? A. Motors to run upon lighting or power circuits must be wound for the voltage of these circuits, usually 52, 115, 230, 500 thereabout. A ¼ horse power is in round numbers about 200 watts, and the motor would use at each of the voltages named above as many amperes as the quotient obtained by dividing 200 by the voltage. 2. Would a ¼ horse power motor be capable of turning any machine that a man can turn by hand? A. Yes, for all day long. No, for a brief period. Rankine gives figures which show that a man will exert about one-tenth horse power working on a crank for 8 hours per day and about ½ horse power for a minute or two. 3. Is there any way to measure the horse power of a motor or engine other than with special instruments? And if so, how is it done? A. The power of a motor is derived from the watts of electricity used as above. These are measured by a wattmeter; 746 watts are 1 electrical horse power. The watts may be calculated from volts and amperes. They are the product of the volts by the amperes used. These are measured by special instruments. You cannot measure electricity without proper measures any more than you can measure a string without a yard stick or graduated rule.

(7374) F. M. C. asks: 1. What is the practical difference between a dynamo and a motor? A. The differences are such as to fit the motor for the space it is to occupy, to keep out grit and to keep in the magnetic flux, etc. There is usually no attention paid to ornamentation or polished parts in the motor. There are many such practical differences. 2. Can one be used for both without any alteration? A. Yes, electrically. 3. What would result if the change were made with the armature at full speed. A. It would run right on without any apparent difference, if the poles were the same in the motor as they had been in the dynamo. 4. Where can information be had as to what has been done (or attempted) to save the power wasted in stopping street cars (modern electric)? A. We have not at hand the information desired. 5. What is the percentage of loss in the above? A. As much as would bring the car from rest up to the same speed again. We do not know what it is a percentage of, and hence cannot tell what percent age it is.

(7375) M. J. M. writes: Having carefully read your valuable articles on acetylene gas in your SUPPLEMENT and SCIENTIFIC AMERICAN, I write for information regarding the closing sentence of the resume of "Explosions," in the February 5th issue of the latter paper, viz: "Acetone as a solvent has not yet received sufficient application to judge of its possibilities." Pleading ignorance, I would ask how acetone enters into the case? Does acetylene gas condense in the service pipes and chandeliers and form an explosive compound? Before the gas enters, the pipes and chandeliers are, of course, filled with air. Is there any danger of an explosion if the initial gas is lighted before it has had time to drive out all of the air? I have never heard of such an accident either with common or with acetylene gas, but would like your opinion in the matter. A. Claude and Hess found that at ordinary temperatures and pressures acetone dissolved 25 times its volume of acetylene and at 12 atmospheres pressure (185 pounds per square inch) 300 times its volume. Further, that with a rise of temperature, the increase in pressure is due to the tension of acetylene itself, according to Berthelot and Vieille, although acetone boils at 127·4° Fah. The solvent power of acetone was also found nearly proportional to the increased pressure. The following table will give a few interesting details:

Percentage of acetylene in the acetone.	Temperature Fahrenheit. Degrees.	Pressure, pounds per square inch.
22	59	100
	167	290
37	59	177
	140	400
64	59	290
	131	472

Liquefied acetylene, which possesses marked advantages in transportation and using, requires reservoirs of such great thickness and strength by reason of its high pressure that the dangers from it are equal to those from liquid ammonia or carbonic acid gas. To reduce the thickness of these cylinders and render them more safe by using lower pressures, and still have liquid contents, acetone was proposed. In this country it has been experimented with, but is not handled commercially; it has, however, been found practicable, outside of a few minor inconveniences. However, if such flasks are submitted to high temperatures, they are liable to explosion; for, although the acetylene is in solution, as soon as the pressure is released it is set free comparatively pure and free from acetone. In using, the flask is simply attached to the service pipes, provided with a pressure regulator and used until the pressure falls to outside pressure. Acetylene is a true gas and, like all fixed gases, tends to fill completely the space confining it. It is nearly the same weight as air and does not stratify or segregate in a holder. It does not condense below about 68 atmospheres pressure. It is supposed to unite with copper (in the presence of ammonia only) and form an explosive compound, although experiments have not verified the fear that such formations are dangerous. It is thought safe even to use pipes or burners made of copper or brass, having no real evidence to the contrary. The answer to the next question is found in practice. When a set of burners are turned off at the main pipe, the gas gradually leaks out through the burner into the room, and is replaced partly by air. Now, when the gas is first turned on it will not ignite for an instant, until the acetylene gets to the burner; we have never heard of an explosion from this cause. Le Chatelier says that a flame will not strike back through a tube 0·02 inch diameter, but may through one 0·04 inch in diameter. A burner for acetylene has an orifice of 0·015 inch diameter; so that the safety is ample on that score. As it can be used in a Bunsen burner, with small burner tube, without striking back, it is evident that the danger of this happening with burners such as the Naphys or Bray is very minute indeed.

INDEX OF INVENTIONS

For which Letters Patent of the United States were Granted

MARCH 1, 1898,

AND EACH BEARING THAT DATE.

[See note at end of list about copies of these patents.]

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