

# SCIENCE

FRIDAY, JULY 8, 1887.

IN THE LEADING civilized countries in which a decimal system of weights and measures is not in vogue, there are considerable bodies of men urging the adoption of at least a decimal coinage. From time to time attacks are made on the time-honored and inconvenient pounds-shillings-and-pence system in which English trade is carried on, but thus far conservatism has proven too mighty even for convenience. It is nevertheless true, that, each time the agitation for a decimal system is begun in Great Britain, it obtains larger support than before, though the opposition to it loses nothing in vehemence. Within a few weeks an influential deputation has waited on the chancellor of the exchequer to urge his advocacy of a decimal coinage. The deputation represented sixty-eight provincial chambers of commerce, all of which, out of a total of sixty-nine, have passed resolutions in favor of a change to a decimal system. The deputation urged the change on five grounds: first, because every foreign country in the world possessed a decimal currency, and some of the British possessions (Canada, Ceylon, and Mauritius); second, because no country which had once adopted the decimal system of currency had retraced its step; third, because the mathematical education in the schools would be simplified by the use of the decimal system for measuring values, and consequently the period necessary for education in the elementary schools would be shortened; fourth, because experience proved that in business-houses in decimal-using countries considerable time was saved in calculations both for home and foreign business, while transactions between countries using the decimal system were rendered uniform, and an economy of labor therefore resulted; and, fifth, because the British currency might be placed upon a decimal basis with a minimum of change by decimalizing the pound sterling. It is proposed to decimalize the pound sterling by making it equal to 1,000 mills, the mill to be the unit of the system. Then the half-sovereign would equal 500 mills; the crown, 250 mills; the double florin, 200 mills; the half-crown, 125 mills; the florin, 100 mills; the shilling, 50 mills; and the sixpence, 25 mills. Three new coins would be necessary, — a dime, equal to ten mills; a half-dime; and a new farthing, equal to one mill. Various speakers enlarged on these arguments. Mr. Goschen, in reply, acknowledged the importance of the subject and the authority of the delegation, but he could give no promise of government action, because a reform of so far-reaching a nature depends for its success on a practical unanimity of popular sentiment; and that, Mr. Goschen thought, is far from having been reached at present. He closed by encouraging the deputation to go on with their propaganda, and endeavor to unite public sentiment in favor of the change. If that were done, he felt sure the necessary legislation would follow.

IT IS THE PRIVILEGE of the philosopher, at least of such a one as bases his right to that title on the practical comprehensiveness of the study of his choice, to have an important word on those general problems of civilization most intimately connected with human development. And it is the privilege of our age to emphasize the truth that every intellectual worker is to a greater or less extent a philosopher in his own domain. It is not a coincidence, but a deeply significant fact, that the 'new education,' the 'new political economy,' the 'new psychology,' the 'new biology,' and the rest, are all claiming attention at the same time. It is the expression of the consciousness of the changed conditions of modern life. A most

alarming symptom of this change is the increasing frequency of mental 'breakdown,' caused by a failure to adapt one's self to the changed environment. For the use of the mental powers, we now substitute their abuse. The business-man is worried into insanity, the student hurried into unhealthy precocity, and the woman forced into an imprudent competition with man. One of the earliest cries of warning to the most restless of all nations, the Americans, was raised by Dr. S. Weir Mitchell, in a paper entitled 'Wear and Tear,' which has just reached a fifth edition as a separate publication. In the period since its first appearance, this sermon has been preached by educators, political economists, and psychologists, as well as by the family physician, and to some extent has been listened to. Practical men are so apt to think that the studies of the theoretical scientists are more or less the pursuit of useless hobbies, that the opportunity of so glaringly showing the essential importance to them of theoretical science should not be neglected. To be able to express physiologically and psychologically such doctrines as are suggested by the practical experience of thoughtful men, endows these principles with the authority of natural laws, and sanctions their introduction into the elementary education of the next generation. It makes science out of opinion. The cause which Dr. Mitchell pleads under the above terse heading is well known to-day. It is simply the problem of obtaining a maximum of work with a minimum of overwork; a brisk and healthy wear without a rushing and wasteful tear. And it is because this problem is so largely the problem of a rational education founded upon a scientific psychology, that it merits notice in this column. With the successful solution of this problem, — and all this applies with increased force to our country, — the new education, the new political economy, the new psychology, and the new biology will all have succeeded together.

## THE INCREASE OF STATE INTERFERENCE IN THE UNITED STATES. — II.

AS TO THE States of Rhode Island and Connecticut, our information is fairly full and accurate, though showing a curiously divergent condition of things in two adjoining States. The secretary of state for Rhode Island finds, as the result of nearly twenty years' experience in connection with the legislation of the State, the tendency has rather been away from than toward interference with personal concerns. Numerous matters of that nature which formerly occupied the attention of the Assembly have now ceased to have attention, the jurisdiction of the courts having been enlarged so as to cover such matters. The Legislature has further established a joint rule to the effect that "neither House shall entertain any petition the subject of which is within the jurisdiction of any court in the State." Rhode Island, owing to a peculiar constitutional provision, has no general act of incorporation, and every charter is a special act of the Legislature. In granting these charters, much of the time of the Assembly is occupied.

From Connecticut Professors Hadley and Farnam of Yale agree in pointing out the Sunday traffic (railroad) law, the law limiting the hours of employment for women in stores and factories, the law prohibiting child-labor under thirteen years of age, the law making weekly payments compulsory, and the laws providing for the inspection of certain classes of business, as the latest particulars in which State interference is being manifested. Mr. A. Hills of Bridgeport finds that Connecticut legislation is showing "an increasing tendency to interfere between employers and employed, and generally to regulate matters which individuals ought to be left to arrange between themselves." Mr. Morris F. Tyler is of similar opinion. He writes, "It may be said that legislation in Connecticut shows that in almost all the relations of life the meddle-

some legislator has thought of touching. We do not regulate the price that a man shall pay for his food and clothing, but we do say what kind of food and clothing can be sold to him, and under what conditions. In looking over the statutes of the session just closed, I see that it will no longer be safe for a man to send his children to a private school unless that school complies with some of the technical regulations of the State Board of Education in the matter of returns to their secretary; that a man cannot sell the securities of foreign trust and investment companies in this State unless those companies have submitted to certain examinations by our bank commissioners. Butter and molasses are under the protecting care of the dairy commissioner. Nobody can negotiate the insurance of his neighbor without a license to do so from the insurance commissioner. A man cannot travel on a railroad-train on Sunday, and have the benefit of his commutation or mileage ticket. If, in case of illness in my family, I find there is no brandy in the house, and it is wanted at once, it is illegal for my grocer to give it to my boy if I send him for it in a hurry. If I run a factory, it must be run as the newly appointed inspector of factories says is right, and not as the business may compel me."

The data from New York State which has reached us, while plentiful, is not very specific. The large majority of our correspondents in that State coincide in stating that State interference is on the increase. Assemblyman Ernest H. Crosby of New York City writes that interference has lately been shown in the appointment of such officials as railroad commissioners, factory inspectors, commissioners of arbitration, and so forth, and in acts regulating the price of gas, limiting the hours of labor on street-railways, etc. Mr. Herbert L. Osgood of Brooklyn refers to the Mechanics' Lien Act of 1885 as an interference with the freedom of contract. He mentions also an act compelling employers to erect proper scaffolding for those at work upon buildings, an act regulating the height of dwellings in New York City, acts relating to the manufacture and sale of oleomargarine, the sale of butter, the slaughter of cattle, etc. The State expends about twenty-eight thousand dollars a year in subsidizing agricultural societies.

With respect to State interference in New Jersey, we are in possession of extremely full returns, for the most valuable portions of which we are under obligations to Mr. William I. Lewis of Paterson. Mr. Lewis finds as the result of a careful examination of the legislation since 1878, — to and including the session of 1886, — that about two-sevenths of the laws show a marked tendency toward interference with personal affairs, and about one-seventh additional show a slight tendency in that direction. In the period mentioned above, 2,016 laws have been enacted, and 414 of them are for the purpose of controlling or regulating private and personal affairs or business. Of these 414 laws, seven provide for agricultural experiments; two protect bottlers of beer by establishing a peculiar procedure, and inflicting peculiar penalties on persons who steal bottles or unlawfully have them in their possession; fourteen regulate the sale of butter and milk; one directs how cows shall not be fed; eight are designed to protect children by regulating their employment and education; two to encourage organizations of workmen; one establishes standard packages for cranberries; one provides for the construction of proper waste-gates in dams; four are in aid of deaf-mutes; three regulate the manufacture and sale of fertilizers; two offer bounties for the production of jute, flax, and hemp; fifty-seven are for the protection of game and fish; thirty-six are for the protection of health; two deal with the cutting and sale of ice; twenty-seven regulate the business of insurance; ten establish and encourage a bureau of labor statistics; seven aim to improve meadow and swamp lands; three deal with pilots and their apprentices; six incorporate rifle societies, and encourage marksmanship; seventy-seven concern education; twelve provide for the maintenance of an industrial school for girls; four are for the better securing of wages to workmen; and six concern the relief, protection, etc., of workmen.

This exhibit of Mr. Lewis's exemplifies excellently the tenor of legislation in New Jersey. We could wish that we had as accurate an analysis of the laws elsewhere; but it will be seen that there is general consensus of opinion among our correspondents to the effect that the tendency toward State interference is not confined to any one State or group of States.

Prof. E. J. James of Philadelphia writes that "the course of legislation in Pennsylvania is very similar to that in Minnesota;" and Professor Holmes of the University of Virginia mentions local option, railroad supervision, the multiplicity and inquisitorial character of the taxes, civil marriages, and the drummers' tax law (recently declared unconstitutional) as recent evidences of a similar development of legislative activity.

Our most definite reply from the south-western States comes from Hon. Logan H. Roots, president of the board of trustees of St. John's College, Little Rock, Ark. Mr. Roots says that "a tendency upon the part of the indolent to ascribe their poverty to honesty, and the prosperity of the industrious to dishonesty, seems to have seized the ignorant; and the legislators pandering to that tendency have many of them acted on the theory that any thing or person that prospered was *per se* a 'fraud' which must be regulated. The special 'frauds to be regulated' in the eyes of our recent Legislature were money-lenders, telephones, railroads, and cottonseed-oil mills, with some attention given to prices at which merchants might transact business."

Of the central-western States, Ohio, Indiana, and Illinois are following the same road that we find to be so popular elsewhere. Ohio has a board of stock commissioners with absolute power to regulate the trade in live-stock and all importations, dairy commissioners, and special laws to govern the sale of farm-products, laws prohibiting the sale of liquor in certain places, and so on through a long list.

Illinois is overrun with such laws, and Mr. Edward J. Cahill of Chicago sends us a long list of them. Since 1871, Illinois has been in the grain-weighing business: it designates elevators for the storage of grain, and regulates its transportation by railroad. Mills and millers are carefully looked after, including the manner of grinding, the character of the buildings and tools used, etc. A bounty of ten dollars an acre is at the disposal of those who will plant forest-trees. Fence-laws appoint fence-viewers, who see that all fences are four and a half feet high, and that proper materials are used. A State board of agriculture, with a corps of salaried officials, promotes agriculture and horticulture. This board spent thirty-six thousand dollars in 1885, and is authorized to bestow five thousand dollars annually in premiums at fairs and stock-shows. The Bureau of Statistics, organized in 1879, has become a department of state, and presents annual reports on the social, educational, and sanitary condition of the laboring-classes. Game-laws are numerous. The manufacture of butter and cheese is regulated: five hundred dollars goes every year to assist dairymen in making reports. Illinois offered ten thousand dollars to the citizens who had exhibits at the New Orleans exhibition; it also pays from fifty thousand to one hundred thousand dollars to assist cities which, through the negligence of their officials, fail to take proper precautions against damage and loss by fire and water. Mr. Cahill also points out what the effect of the passage of such bills has been on subsequent Legislatures. In the session of 1887, for instance, about eight hundred bills were presented to the Legislature, and fully three-fourths of them had a tendency toward State interference. "We have bills seeking to regulate contracts between employer and employee, providing for the giving to each party a given number of days' notice to quit or intention to quit, calling for mutual co-operative associations for pecuniary profit, to increase the power of the department of labor, to provide for arbitration of labor-troubles, to grant additional labor-liens, to enforce the eight-hour movement, and to encourage mutual loan associations on the co-operative plan. The effect of State interference with professions and other business interests has created new demands: the architect petitions for a special board; the stenographer demands recognition; and in due course we shall have the merchant-tailor and the corner grocer, for already we have the liquor interest asking for a State board to pass on 'good whiskey'; and the prohibitionist asks for a bureau for the study of the nature and effect of alcoholic beverages, etc.; while the 'mugwump' of religion is on hand, seeking recognition by way of 'ethical instruction' in our public schools; and, to crown the ridiculous, we have the Live-Stock Board, just created, asking 'that companies be formed for the detection and apprehension of horse-thieves;' thus making a farce of our criminal procedure."

Prof. Henry C. Adams writes that in Michigan the tendency is in harmony with that observed by Dr. Shaw in Minnesota.

President Pickard of Iowa State University finds the most striking feature in the recent legislation of Iowa to be the number of legalizing acts passed. He says that twenty-five per cent of all acts passed were designed to correct carelessness or ignorance of officers and municipal corporations; but Prof. Jesse Macy of Iowa College says that Iowa is side by side with Minnesota, and cites in evidence a number of acts passed at the last session of the Legislature. The Legislature passed laws strengthening the prohibitory liquor legislation, it made elaborate statutes regulating the practice of pharmacy and medicine, it looked after the miners' interests through a commission, it provided an arbitration board for the settlement of labor-difficulties, it laid new duties on the board of health concerning canned goods and inflammable oils, and passed a large number of laws of the same general tenor.

Ex.-Pres. A. L. Chapin of Beloit College, Wisconsin, thinks that State interference has not gone so far in that State as in Minnesota, though it is plainly seen in numerous enactments.

Mr. Frank R. Morrissey of the Omaha *Herald* represents Nebraska in our correspondence, and finds a marked tendency to sumptuary legislation in his State.

From the Pacific coast we hear of this tendency, though in California the new State constitution seems to have repressed it to a great extent. Mr. A. H. Agard of Oakland writes that proposed legislation in California manifests the tendency in question; but little progress is made, because the Legislature is restrained by the provisions of the State constitution, which forbids the enactment of laws termed 'special.' The effort on the part of the Legislature is to frame laws of such a character that they will operate restrictively, and yet not be declared unconstitutional by the Supreme Court. It might be termed 'forbidden legislation by adroit evasion.' The particular manifestations of interference just now are against the Chinese, against 'monopolies,' hydraulic mining, and the retail liquor-trade.

It will thus be seen, from this brief summary of the evidence we have gathered, that State interference has a tendency in general throughout the United States. It is more extreme in some States than others; and our analysis of the laws of Massachusetts, New Jersey, and Illinois, shows it to be particularly progressive in those States. It remains to present the various opinions entertained toward State interference by our representative correspondents.

[To be continued.]

#### THE NEW ROUTE FROM ENGLAND TO EASTERN ASIA, AND THE HUDSON BAY ROUTE.

A FEW weeks ago the first steamer coming from Yokohama arrived at Vancouver. Thus the new line from England to eastern Asia by way of the Canadian Pacific Railroad has been opened. In order to show the merits of this route as compared to the American Pacific railroads, we have drawn up the accompanying sketch-map. We have chosen the gnomonic projection, as it is the best means to show the shortest route between two points. The earth's surface is projected from the centre of the globe upon a tangential plain touching it in latitude 60° north and longitude 120° west. In this projection all great circles, i.e., the shortest lines between two points, are represented by straight lines. The map extends from England in the east to Yokohama in the west. It makes it clear why the North-west and North-east Passages were so eagerly sought for. They are the nearest to the great circle between England and China, which runs right through the Polar Basin. The nearer a route approaches this great circle, the shorter it is. Therefore it will be seen that the distance from London to Yokohama, *via* the Canadian Pacific Railroad, would be by far the shortest. There are several facts, however, which detract from the value of this route. We have drawn out the great circle between London and New York. It will be seen that it crosses Newfoundland. Yet ships do not keep close to the southern point of that island, on account of the numerous dangers obstructing their passage, but prefer to go a round-about way, keeping far south. The same difficulty is encountered in approaching Halifax; and therefore the longer route to New York is by far to be preferred to the shorter one to Nova

Scotia, particularly in the latter part of the winter and in spring, when ice is met with in the Atlantic Ocean. The Gulf of St. Lawrence is not navigable during part of the year on account of the heavy masses of ice. Thus the shortness of the route from England to Nova Scotia is more than counterbalanced by the dangers of navigation.

But even from New York the Canada route to Japan is far shorter than that by way of San Francisco. The difference in length between the great circle San Francisco-Yokohama and Vancouver-Yokohama may be seen on the sketch-map. It must be considered, however, that the latter cannot be made use of, as it crosses Alaska and the Aleutian Islands. Steamers must keep farther south, and must strike the San Francisco route near the longitude of the west point of Alaska Peninsula. This makes the distance from Vancouver to Yokohama somewhat longer than it would be without this chain of islands intervening. The distance from New York to Puget Sound by way of the Northern Pacific Railroad is longer than by the Canadian Road, as Lake Michigan extends so far south; but when the road from Umatilla Junction to Tacoma is finished, the difference in the two distances will not be very great. The sea-route from Tacoma to Yokohama is of course essentially the same as that from Vancouver. The great circle between these places and the ports of China runs nearly through the Tsugaru Strait, passing Hakodadi.

When the work on the Canadian Road is completed, it will probably be not more frequently obstructed by snow-drifts than the Northern Pacific, but the difference in distance between these two lines is not so great as to exclude a successful competition.

The harbor of Vancouver is Burrard Inlet. It is sheltered from the sea, but the entrance is somewhat difficult, being very narrow and occupied by tide-races. The shortest route from the port would lead through the narrow channels between Vancouver Island and the mainland, in which navigation is difficult on account of the strong tides and numerous rocks.

The shortest route from the ports of the Atlantic coast to Japan and China would lie even farther north than the Canadian Pacific Railroad; and if the Saskatchewan branch should be built, and continued to the northern part of the coast of British Columbia, the distance would be still more diminished. We do not believe that the climate would offer insurmountable difficulties, but the settlement of these countries will not be so rapid as to justify the construction of a new Pacific railroad.

The railroad question is of the greatest importance for the development of the North-west Territories, — Athabasca, Alberta, Saskatchewan, Assiniboia, and Manitoba. The distance to the nearest ports is so long that export is very difficult: therefore endeavors have been made to open a new route by making use of Hudson Bay. It will be seen on our map that the proposed Hudson Bay route from Liverpool to Port Nelson is very short and straight, and that it would offer a splendid opportunity for the export of the North-west Territories. We believe, however, that the character of the seas will prevent the plan being carried out. The railroad-route from Winnipeg to Port Nelson has been surveyed, and no serious obstacles are said to exist; but the railroad must be continued farther north to Fort Churchill, as Port Nelson is not a safe harbor. The navigation of the west coast of Hudson Bay, particularly for large vessels, is very difficult on account of its shallowness, and the construction of piers in Fort Churchill will be expensive and difficult on account of the ice.

The principal difficulty is the navigation of Hudson Strait. Its eastern entrance is blocked by pack-ice until the middle of July. A passage may sometimes be forced early in June by a ship well strengthened against the pressure of the ice, but navigation cannot be opened until about the 10th of July. About this time, ice is still whirling around in Ungava Bay, patches are found near Charles Island, and Fox Basin is filled with very heavy and dangerous masses of ice. We believe that these form the principal obstacles to navigation. The light ice of Hudson Bay and Hudson Strait will not form serious obstacles late in the season; but a spell of northerly winds will invariably drive the heavy masses of Fox Basin into the Strait, and a ship caught in this ice will be in an extremely dangerous position. The floes are small, and attain a thickness of from twenty to thirty feet. This ice frequently blocks