SYDNEY INTERNATIONAL EXHIBITION.—1879-1880.

Extracts from the Report of the Judges in Horology.

DEPARTMENT III.—EDUCATION AND SCIENCE.

Group—Scientific and Philosophical Instruments and Methods.

Class 310.—Chronometric Apparatus, Chronometers, Astronomical Clocks, Watches, Chronographs, etc., etc.

Judges.—John McGarvie Smith, New South Wales.
P. E. Bound, Switzerland.
H. C. Russell, B.A., F.R.A.S., Great Britain.
E. Beckmann, Germany.
Gregory P. Harte, United States.

To the Honorable Committee on Judging and Awards, Sydney International Exhibition.

GENTLEMEN: I have the honor to hand you herewith the report of the judges of Class 310, as above,

And remain, sirs, your obedient servant,
GREGORY P. HARTE, *Chairman.*

The following exhibits were submitted for examination:

U. S. Exhibit, 537, American Watch Company, Waltham, Mass., U. S. A.—Watches and Chronographs.

British Exhibit, 1,048, Victor Kullberg, London, England—Watches and Chronographs.

British Exhibit, 1,054, Nicole & Nielsen, London, England—Watches, Chronographs, etc.

British Exhibit, 1,060, T. Russell & Sons, London, England—Watches, Chronographs, etc.

British Exhibit, 1,041, Castleberg & Co., London, England—Watches, etc.

British Exhibit, 1,060a, S. Backschmid, Switzerland—Watches.

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German Exhibit, 36, A. Lange & Sons, Dresden, Germany—Watches, etc.

Swiss Exhibit, L. Audemars, Brassus, Switzerland—Watches, etc.

French Exhibit, 146, A. H. Rodanet, Paris, France—Chronometers.

French Exhibit, 177, G. Tribandeau, Besançon, France—Watches.

Swiss Exhibit, 14a, International Watch Company—Watches.

In presenting the following report, the judges desire to make some explanations, which, we trust, will excuse them in the minds of the impartial for any apparent neglect in the form of their report, and for the limited number of tests made of the horological exhibits.

The judges were appointed too late to do the full amount required, inasmuch as the number of exhibits was so much in excess of any reasonable allotment for examination and report before the closing of the Exhibition.

Commencing their labors, however, immediately after the first call, the examinations were not complete until March 3d, which only permitted a time test to be made of nine days in a single position. This single position was objected to by some of the exhibitors, but ill-advisedly, for the ratings observed in the watches of the objecting exhibitors were of such character as to establish in the minds of the judges the conclusion that their watches would not have made so good a comparative showing if there had been more time to observe the ratings in other positions.

Great care was taken by the individual judges in making up their note books during the examination of the watches, and scrutinizing the inherent and comparative merits of exhibits under the ten different heads unanimously agreed upon, as follows:

1. Originality.
2. Invention and discovery.
3. Utility and quality of material.
4. Skill in workmanship.
5. Fitness for purposes intended.
6. Adaptation to public wants.
7. Economy.
8. Cost.
9. Finish and elegance of cases.
10. Time-keeping qualities.

It was agreed the judges should use the number 100 as expressing the highest degree of excellence in each of these ten elements of inherent and comparative merit, and adjudge individually to each of the several exhibits such rating as their respective judgments would warrant after careful examination; each set of opinions being made a portion of this report, and in the *résumé* the mean average being taken as the unanimous verdict of the judges.

It was also decided we should take up each exhibit in the order originally examined, and, beginning with the first element of merit (originality), each judge should in numbers express his judgment of the inherent and comparative merit attaching to each exhibit in this one element; this being done, to proceed with each succeeding element in order and in the same manner. The five judgments being complete and in numbers, the aggregated verdict is arrived at simply by addition and division.

This is not only a verdict as to the inherent and comparative merits of each exhibit, but also a full analysis of each order of merit in any exhibit as compared with all the others. . . .

In giving this verdict it was absolutely necessary to ascertain to the fullest extent the time-keeping qualities of the exhibits. The judges were led to this conclusion from the fact that in some of the exhibits we were shown watches of equal finish containing every known application of horological science in practically the same construction, which should, as far as they could determine by merely optical examination, keep quite as good time as watches of double and treble the costs in other exhibits, thus involving their judgment in doubt upon several elements of merit.

In justice to themselves and to the exhibitors the judges determined to make the test in only one position, and give the whole of the time at their disposal to testing the watches in what might be considered their normal position, if such term is allowable—that is, "pendent up," or hanging.

At the solicitations of the judges Prof. H. C. Russell, Astronomer Royal at the Sydney Observatory, kindly consented to make the tests, and each of the exhibitors was requested to send three watches of his own selection to the Observatory for this trial.

As will be seen by the report of Professor Russell, eight of the ten exhibitors availed themselves of this opportunity. It is proper, however, to state here that none of the exhibitors apparently anticipated this test, and that it is possible some of the watches might have made a better record if they had been differently attended to since the opening of the Exhibition; but they were in this respect all upon a par.

The majority of the watches had been made for exhibition purposes and specially prepared to that end; and some had been previously rated at observatories before sending.

Notably, however, to the contrary of the above, the exhibit of the American Watch Company was the ordinary and regular product of the factory, such as is finished every day.

Notwithstanding the possibility that these exhibits might have been better prepared for observatory time tests, some of the exhibits, as will be seen by the rating, demonstrate the wonderful advances made in the application of horological sciences to the manufacture of watches, and that their rating is being made equal to that of the best marine chronometers.

The following is the report of Professor Russell, and the accompanying diagram (see next page) will readily give an idea of the comparative performance of the different watches.

"*Sydney Observatory, 26th February,* 1880.

"GREGORY P. HARTE, ESQ.,
"*Chairman of the Judges in Horology.*

"SIR: I have the honor to report that, in response to your circular, inviting exhibitors of watches each to send three watches to the Observatory to be tested, I received on Monday, February 16th:

"Three watches, Nos. 611, 669, 237, from Mr. Dolman, agent for Mr. Tribandeau, Besançon.

"Three watches, Nos. 987271, 670068, 1221336, from Mr. Manson, agent for Waltham Watch Company.

"Three watches, Nos. 3171, 1935, 2526, from Mr. Aller ding, agent for Mr. Kullberg.

"And on the forenoon of February 17th:

"Three watches, Nos. 11527, 19967, 12629, from Mr. Hoff nung, agent for Lange & Sons.

"Three watches, Nos. 1004, 8632, 8370, from Mr. Jacob, as agent for Nicole & Nielsen.

"Three watches, Nos. 70690, 23496, 113516, from Mr. Jacob, as agent for Thomas Russell & Sons.

"One watch, No. 47150, from Mr. Jacob, as agent for Castleberg.

"Three watches, Nos. 12731, 12483, 11680, from Mr. Wiesener, as agent for L. Audemars.

"And on 18th February:

"Two watches, Nos. 2724, 3528, from Mr. Jacob, as agent for Castleberg.

"On the 17th I began rating these watches, keeping them all in one position (hanging), and subject to the same conditions of temperature; in fact, they were all hung on one board, and kept in a compartment locked up so as to avoid change of temperature, except such changes as were due to changes in the weather.

"They were rated once a day by the standard clock, which affords special convenience for this work, and the error of which was found by daily astronomical observations giving the absolute time; great care was taken in rating so as to get the exact error of each watch every day, care being taken at the same time to avoid errors in the seconds dials, a fault sufficiently obvious in some of these exhibits.

"In presenting the result of this test in the form of a diagram (see diagram on the opposite page), it is necessary to explain that the curves show only the change of rate in each case, and nothing is shown here of the actual rate, which was large in several instances.

"In the diagram spaces between faint lines represent seconds; and the thicker faint lines represent the mean rate in each case: When the curve rises it shows that the watch was gaining on its previous rate, and when it falls the watch was losing on its previous rate. For example, in No. 4 curve the thicker line shows the position of a gaining rate of 3 sec. per day; on the 18th, watch No. 4 had a gaining rate of 2·7 sec., and is plotted below the thick line; on the 19th and 20th it was less than 3 sec., but on the 21st the rate increased to 4·8 sec., and the curve rises above the line. The same rule is followed with losing rates; and, therefore, each curve shows whether the watch was gaining or losing on its own rate.

"For convenient reference the barometer and temperature curves are plotted on the same sheet; although from the short time at command the watches could only be tested in one position, a glance at the diagram will show that in some degree at least the temperature adjustment and the isochronal properties of the balance springs were also tested; and I wish to call your attention to the fact that the whole of these watches show in a more or less degree a marked response to the change in temperature, some being over and others under corrected.

"This fact is important, because it adds another proof that the old form of compensation balance—even when combined with chronometer spring and escapement and all the refinements which the best modern workman can add to it—fails to yield a complete correction for temperature; and I much regret that the American Watch Company, who claim to have overcome this fault by means of a balance involving a new arrangement of the metals, did not send to be tested any of their first-class watches containing this important improvement.

"Several of the rate curves, especially Nos. 4, 10, 13, 16, 21, and 24, respond to the change in the barometer in a way that shows the isochronal properties of their balance springs are not quite perfect. *Looking down the curves it becomes at once evident that watch No. 5, which is No. 670068, second grade of the American Watch Company, is remarkably free from these defects, and presents the best rate of all the watches tested.* No. 9, which is No. 2526, Kullberg, is the nearest approach to No. 5; indeed, the difference between its highest and lowest rates is 0·1 sec. less than No. 5, but it has not such a steady rate The timekeeping of both these watches is remarkably good, and shows that we have entered upon a new era in the manufacture of pocket chronometers; *for these rates are better than the majority of marine chronometers.*

"*Among the cheaper watches tested, No. 6, which is No. 1221336, of the American Watch Company, is worthy of notice; it is a watch of the sixth grade, yet its performance has been better than that of many very expensive and otherwise first-class watches among those tested; such a watch speaks volumes in favor of the system under which it was made, and is the best comment upon the accuracy of the machines that produced it.*

"There are several watches among those tested which have kept wonderfully steady rates, but their comparative merit is shown in the diagrams much better than it could be by any description. The daily rate of each watch will be found in a table attached.

"The changes in Nos. 1, 2, 3, 17, and 19 were too great to plot.

"H. C. RUSSELL,
"*Government Astronomer.*'

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CONCLUSION OF THE REPORT.

In consideration of the facts developed in this examination, and the preponderance of elements of inherent and comparative merit adjudged by the judges (each in independent judgment) being equal to nearly 70 per cent more than the next highest exhibit, they have found it exceedingly difficult to make such a classification in degree as will give even-handed justice to all.

We adjudge to the

AMERICAN WATCH COMPANY, OF WALTHAM, MASS., U. S. A.,

a first-class award, and such other special distinction, diploma, medal, or award, as is consistent with the duties and obligations of the honorable Sydney International Commission, for the largest and most complete exhibit of horologi cal instruments examined.

They also propose, as the only means by which their appreciation of the merits of the production of this company can be adequately or equitably recognized by the Committee on Judging and Awards, that a separate first-class award be given for the timekeeping qualities of all grades of these watches.

Also a separate first-class award for the perfection of this system of watchmaking and the improvements in the mechanical parts of the watch, being notably in the main spring and going barrel, the patent safety pinion, the perfect epicycloidal form of all the teeth of the train, in every grade of watch alike, and the isochronal adiustment of the balance spring.

Also to Charles V. Woerd, mechanical superintendent of the American Watch Company, Waltham, Mass., U. S. A., a first-class award for his new mode of compensating balances.

Also a separate first-class award for the improvements in cases, the number of artistic forms and designs used, the beauty and elegance of their finish, and for their new and indestructible method of enameling.

VICTOR KULLBERG

The display of marine chronometers by this maker, with the Observatory ratings, was of the very first order. Every part of those instruments was remarkably well made, and the modifications of some of the balance wheels worthy of special attention. Adjudged a first-class award.

The display of watches by the same maker, although small, commanded attention from their very nice finish in all parts. As will be seen from the report and diagram of Professor Russell, they are good timekeepers, especially the one having the chronometer escapement. This style of watch, however, is of too delicate construction and too costly to fully meet the requirements of any considerable public want. The same objection will hold good as to the lever escapements as far as cost or economy is concerned, they being comparatively too high priced. Representing a certain class of manu facture, they are of the first order of merit, and adjudged a first-class award.

The "gas governor" exhibited by the same maker, an instrument for regulating the amount of heat in the testing of chronometers, is commended as a useful invention.

[*Continued on page* 10.]

SYDNEY INTERNATIONAL EXHIBITION.

[*Continued from page* 8.]

NICOLE & NIELSEN.

This exhibit, made specially for the Exhibition, comprised a full line of plain levers, split seconds, chronographs, calendars, repeaters, etc., and was a representative display of their peculiar style of manufacture in all its details. The cost of these watches, compared with others of similar construction and finish, was excessive; and while they show good timekeeping qualities, they do not equal that of other exhibits.

As representing their own methods of construction they are of the first order of merit, and are adjudged a first-class award.

THOS. RUSSELL & SONS

exhibit a full line of their manufacture, which, upon comparison with other exhibits of the same general character and construction, places them in the third order of merit, and they are adjudged a third-class award.

S. BACKSCHMID

exhibits a class of cheap watches of very inferior workmanship and finish, of the last order of merit, and adjudged a fourth-class award.

N. CASTLEBERG & CO.

exhibit a meritorious line of watches in many respects, of good finish, and not excessively high priced for their performances; of the second order of merit, and adjudged a second-class award.

A. LANGE & SONS

exhibit a class of watches possessing many elements of merit, and of superior finish in many respects and at a cost which is quite reasonable. That the watches are constructed upon scientific principles and are intended as reliable timepieces, is shown from Observatory tests. The variations show that care has been taken to approximate a perfect adjustment, and that a partial success has been attained. A peculiarity in the construction of the balance wheel—having a horizontal split from the timing second holes each way—is noticeable, which we fail to understand. This exhibit was made expressly for this Exhibition, and Observatory rates sent with each watch, and, as a representative exhibit, although small, was the second best examined, and is, in its class, of the first order of merit, and adjudged a first-class award.

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LOUIS AUDEMARS

exhibits a wonderful class of complicated watches, calendars, repeaters, chronographs, etc., etc., combined in one watch, and elaborately cased and artistically finished. The great element of merit in this exhibit is in the combination of the great number of unusual functions for a watch, and by skill in workmanship and mechanical science securing a correct performance.

The enormous cost of these watches is an effectual embargo on their use to any except the very few, and their utility is, therefore, very limited. In their class they are, however, of the first order of merit, and adjudged a first-class award.

G. TRIBANDEAU

exhibits a considerable collection of watches in a great variety of cases, of a class of workmanship, finish, and performance calling for the fourth order of merit, and are adjudged a fourth-class award.

A. H. RODANET

exhibits two marine chronometers only, one of which was broken and the other out of order; commended.

INTERNATIONAL WATCH COMPANY

exhibit a collection of watches of the third order of merit, and adjudged a third-class award.

In concluding this report, the judges very much regret the limitation in time which has prevented them securing position tests of this very interesting exhibit in horology, as much on account of the exhibitors as on their own account. Such advances have in the last few years been made in this science that, in the interest of the public as well as of the manufacturers, a sufficiency of time is desirable to make tests in five or six positions, and fourteen days should be allowed to each position. Tests for heat and cold, and an opportunity to carefully note barometric and thermometric influences upon the various systems of adjustment, would be very valuable and interesting.

Respectfully, etc.,

GREGORY P. HARTE, *Chairman*, United States.
H. C. RUSSELL, B.A., F.R.A.S., Great Britain.
J. MCGARVIE SMITH, New South Wales.
P. E. BOUND, Switzerland.
E. BECKMANN, Germany.

Corn Magnets.

Every kind of salve or lotion that is supposed to remove or relieve corns meets with a large sale. Corn files and pencils are getting stale, and an enterprising inhabitant of Dresden has lately brought out what he calls a "corn magnet." It is evident that it is as unlike a magnet as possible, for an examination shows that it is made of sulphur colored with graphite. The directions are to set fire to one end, and let a drop of the melted sulphur fall upon the corn. A convenient and agreeable operation, especially if the corn is on the bottom of the foot. It is needless to say that the corn usually survives the slight burn and lives to torment the owner again. All burns, whether by caustic or otherwise, should be avoided.

Experiments on the Resistance of Materials.

Prof. J. Burkitt Webb, C.E., now in Europe, writes as follows:

On the invitation of Prof. Spangenberg we visited the "Versuchsstation," at the Gewerbe-Akademie, where the important experiments upon materials for engineering purposes are being made. These tests are of two kinds—trials of strength and trials of endurance. The first are made by means of very heavy and accurate machinery, mostly new within the last two or three years; the latter are the celebrated "Dauer-Versuche," a description of which we will reserve for another letter.

The main machine, of which there are three or four duplicates at work at various points in Germany, is housed in a special building in the interior court of the academy. It consists of heavy iron "ways," some fifty feet long, accurately planed and secured to a stone foundation, with a hydraulic pump and scales at one end, and a number of massive attachments for subjecting the piece of iron or other material to various kinds of strains. There are also other instruments which belong to the machine as delicate as it is heavy, and which are used for adjusting the parts of the apparatus, reading the results of a test, or making calculations. This machine differs from others in the way of measuring the force used. It has been the custom to take the pressure on the liquid in the hydraulic cylinder, as shown by a manometer, as the basis of calculation. This introduces an inaccuracy, as part of this is due to the friction on the piston packing, and the true pressure is less than that shown by this irregular quantity. To avoid this difficulty a massive lever is introduced between the hydraulic press and the point where its pressure is applied. One arm of this lever is one-eighth inch long, and the other five hundred times as long, so that to measure a pressure of one hundred tons, four hundred pounds must be placed on the scale pan which hangs from the end of the long end of the lever. The fulcrum rests against the piston, and the short end of the lever is connected by heavy links with the apparatus by means of which the strain is applied. Technically speaking the fulcra of scales are "knife edges," but to convey a pressure of one hundred tons and remain free to move, these edges must be very obtuse, perhaps 160° to 170°; they must be as long as possible, some fifteen inches, of the best hardened steel, accurately ground, and must rest against a hardened plate of steel. Made with the greatest care the sharp edge under such a pressure will sometimes make a dent in the plate and the scales are clogged. As it is very difficult to measure the one-eighth inch with accuracy, another lever is provided with a ratio of one to ten, and with a short arm long enough to be made of a certain length with but a small percentage of error. To test the main lever this occupies essentially the same place as a sample of iron to be stretched; it is loaded with, say, two hundred pounds, which it multiplies to a ton; this pressure is then weighed by placing four pounds upon the main scale pan, and the fulcrum of the main lever is adjusted until the two weights balance.

The attachments consist of: I. Jaws for holding round, square, and flat bars to be submitted to tension. II. Arrangements for holding beams and columns in various ways at their ends, and compressing them until they are crushed or "buckle." III. Two massive graduated iron beams, which are placed crosswise on the "ways," and used for twisting shafts, railroad axles, etc. IV. A face plate, about four feet square, for holding plates of boiler iron nearly as large by the perimeter, and crushing in the middle by forcing various shaped pieces against it. V. Apparatus for bending a beam by crushing an angular piece into it; and in the same connection, VI. Shears for cutting off bars of metal and measuring the force required.

In connection with this main machine were some, quite old, which had been used in the infancy of the subject by a former professor, and a new special machine for the same purpose as attachment V., and which seemed to "kink" a piece of railroad iron as if it were only lead. In this the pressure was obtained by screws.

Among the instruments used for the adjustment of the parts of the main machine we saw the finest cathetometer we had ever seen. This instrument, by Breithaupt, in Cassel, has two telescopes, with micrometer screws with more than one hundred and twenty-five threads per inch, and scales graduated on glass with more than six hundred and twenty five divisions to the inch. Another instrument for measuring the deflection, in two directions at once, of a column under pressure, has micrometer screws with more than two hundred and fifty threads per inch. We saw also a planimeter, which not only calculated mechanically the area of a figure, but gave also its center of gravity, moment of inertia, etc. We saw also a French calculating machine; the other apparatus is, we believe, all German. If one is, however, critical, it will be found in many lines of business that all the fine goods here are imported, though naturally the Germans are slow to acknowledge it.

We witnessed the experiments on a sample of round iron over an inch in diameter, and on a piece of iron plate three inches wide by half an inch thick. It is perhaps needless to say that they seemed to stretch like putty and to break like thread. The pressure is put on a few hundred pounds at a time, and the elongation is read by two telescopes and a scale, which multiply the distance five hundred times. At the same time the first "elastic limit" is watched for. Before this is arrived at the piece will return to its original length when the tension is removed; after this the stretching is in part permanent. One of the facts brought out is that there are *several* elastic limits, in copper seven or eight. The appearance of the surface after the elastic limit is passed and the iron stretches is peculiar. A wavy appearance is seen, and longitudinal ridges begin to form, due to the changes going on in the crystals, by which they adapt themselves to the increased length. After a further general adaptation of structure becomes impossible, these appearances culminate in the weakest part. The apparatus for measuring the increase in length has long since been removed, and the places where it was attached have been filed smooth to avoid introducing the weak point artificially. The diameter of this part now reduces rapidly, and the surface becomes rough and the iron hot—you can see it stretch. When it has reduced twenty-five or more per cent it gives way suddenly with a sharp crack. The percentage of reduction before breaking is now recorded with the observations on the elasticity and the breaking strain, and the experiment is at an end. It suggested itself to see if the work done in pulling the iron apart was fully accounted for by the heat generated. We could easily calculate the work up to the point of maximum tension, but after this the force required was not measured; however, a rough calculation showed that the iron was as hot as required, or at least that the data would require to be quite complete if any residual was to be found.

Berlin, May 13, 1880.

ENGINEERING INVENTIONS.

An improved wheel guard, which will push any obstacles on the track aside, and which can be adjusted to a greater or less height above the rails, has been patented by Mr. Solomon Brisac, of New York city. It consists in a wheel guard formed of a metallic box with a beveled front side, which box is adjustably fastened to the front end of a recessed plate resting on and partially surrounding the grease box. The box is braced by means of a rod attached to its forward end and passing into a socket fastened to the bottom of the car.

An improved water motor, constructed on the general principle of a rotary engine, in which two compartments are arranged side by side, with a partition intervening, and in which the sliding pistons in the piston wheels in the two compartments are arranged at right angles to each other, has been patented by Mr. William E. Seelye, of Anoka, Minn.

Mr. Stephen Barnes, of New Haven, Conn., has invented a vibrating propeller, adapted to small boats and vessels to be operated by either hand or steam power. The floats are arranged so that they will offer no resistance on the return stroke.

An improved device for removing snow from railway tracks, and especially from between the rails, has been patented by Mr. David M. Horton, of Fishkill Village, N. Y. It consists of a revolving brush, a mould board in juxtaposition thereto, and a fan blower, in combination with suitable driving gear for propelling the brush and fan.

An improvement in steam traps, patented by Mr. Hugh O. Ames, of New Orleans, La., consists in combining with a vibratory arm carrying a water receiver, a side apertured hollow trunnion, a discharge pipe, a jacketed standard, and an outlet pipe.

An improved cotton press has been patented by Mr. Alfred A. Janney, of Montgomery, Ala. This invention relates to an improvement in the class of cotton and hay presses in which the follower is worked by a screw that passes through a nut, to which the required rotary motion is imparted by means of lateral sweeps or levers. It consists in the means for supporting and securing the levers and forming a vertical guide for the screw, so that the levers are prevented from rocking or swaying as power is applied in the operation of packing.

Improved Steam Canal Boat.

The late experiments in canal steamboats bid fair to be a complete success. The Baxter steamers were not sufficiently remunerative to continue the building of that kind of boat. They do not carry a sufficient load, owing to their build, and that is made necessary by the form and arrangement of the machinery and propelling power, the propeller being that form used by the tug in Buffalo. The new style, which bids to pay handsomely, is as full a bow and stern as the ordinary first-class canal boat. The propelling power is radically different from the tug propeller. The wheel is eight feet in diameter and placed close to the stern; the boiler is upright, with a single engine, very compact machinery, taking up no more room than the stable in many boats, and enabling the boat to carry 7,500 bushels of corn and coal for the trip. With this cargo they run from Buffalo to New York in seven days on five and a half gross tons of coal, saving river and harbor towing. One returned from New York to Buffalo in one hour less than seven days, bringing one hundred and thirty tons of freight. The outlook now promises to supersede mule and horse towing. The Belgian system of cable towing will take that large number of boats now relying on the mule, and deliver them promptly as consigned and in much less time and cost than can be done by the mule. Both systems are necessary for rapid movement on the canal, and to cheapen the transfer from the West to the seaboard. Steam is sure to supersede animal power on the canal, as everywhere else. The canal steamboats are at last so far perfected as to insure a handsome profit in running them, and a large number will soon be at work on the canal. Two are to be constructed in Lockport as speedily as possible by one of our most enterprising boat builders, and the machinery is contracted for, thus opening up a new industry for our numerous and worthy mechanics.—*Lockport (N. Y.) Journal.*