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NAGGAR, Kulu, Punjab,
Br. India

April 4, 1931.

Vl. A. Pertzoff, Esq. M.A.
Dept. of Biochemistry
Harvard University
Cambridge Mass USA

Dear Mr. Pertzoff,

The following extracts of Himalayan medicinal plants
have been sent to your address yesterday per reg. parcel post:

#1 Tibetan name TSEPAD, no doubt Ephedraceae, whole plant used,
Extract: powdered dried plant 1
rectified spirit 6

#2 Tib: BALU. Ericaceae. leaves only used.
Extract: powdered dried leaves 1
rectified spirit 6

#3 Tibetan name MORUA. Very aromatic. Perhaps not medical
Extract: whole plant used, powdered 1
rectified spirit 6

#4 Tib. name: GANGATZU, Ericaceae, whole plant used.
Extract: powdered dried plant 1
rectified spirit 6

#5 Umbellifera. Stem only used. Extract: powdered dried stem 1
rectified spirit 6

#6 Tib. name KORUA. Scrophulariaceae, Picrorhiza, Root only used
Extract: powdered dried root 1
rectified spirit 6

#15 Tib. name YAKIMA (Carophyllaceae ?) whole plant used. Grows only
on 15000 ft. Extract: powdered dried plant 1
rectified spirit 6

NAGGAR, Kulu, Punjab
Br. India

April 4th 1931

VI. A. Pertzoff, Esq. M.A.
Dept. of Biochemistry
Harvard University
Cambridge Mass USA

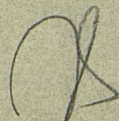
Dear Mr. Pertzoff,

As we are calculating all particulars connected with the erection of the future electric power and lighting plant, we would like to know complete specifications of the requirements of current for your Biochemical Laboratory, viz. whether DC or AC, what voltage, amperage, frequency and total power in KW.

I shall be obliged if you will supply us with the above datae, also giving particulars as to the number of lighting and power points required, at your earliest convenience.

With best greetings, believe me to be

Yours sincerely,



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VLADIMIR A. PERTZOFF
29 SHEPARD STREET
CAMBRIDGE, MASSACHUSETTS

May 8 '31

Dear Mr. Shifayer,

I am glad to send you the necessary specification for the electrical main of the Biochemical Laboratory.

I will save considerable trouble if the current was 105-115 volts, AC, 60 cycles. The power consumption of the various electrical appliances of the Laboratory are given in the table below. Item 5 is approximate. With your short winter little heating should be required. I have allowed 25% for emergencies and expansion. The amperage is given by data supplied.

Power consumption.

1	Electric motor	1.49 KW
2	Refrigerating plant	0.37 "
3.	Pressure pump	2.24 "
	for water (I assume that water is delivered to the level of the Lab.)	
4	Thermostats	3.75 "
5.	Heating of the Lab.	20.00 "
6.	Chemical heaters (all working)	16.00 "
		<hr/> 43.85 "
	Plus 25%	54.80 "

I am somewhat concerned that you should send me extracts of medicinal plants. I have no laboratory equipped for their investigation.

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NAGGAR,
Kulu,
Punjab
Br. India

June 18th 1931.

V.A. Pertzoff, Esq.
29 Shepard Street
Cambridge, Mass.

Dear Mr. Pertzoff,

With reference to your letter of May 8th, stating that you require 55 KW electric power consumption, please let us know what is the absolute minimum that you can do with for the Bio-chemical Laboratory, excluding lighting and heating. We are afraid that we being pioneers in a new country where no conveniences are available, we cannot at once supply so much electric power.

We note that most your requirements go for heating and we would like to know whether you could not suggest some other mode of heating except electricity, for this purpose.

Would you like us to have the furniture and fixtures made, and if so to what designs and sizes (special laboratory furniture) or is it your intention to furnish the Laboratory here afterwards, although this would take a very long time to complete on account of difficulty with skilled labor and the comparatively large amount of furniture to make. If you could send us precise designs to scale with indications where to place them, this would greatly help matters.

Very sincerely yours

Secretary.

*Del. by S. P. R.
H. P. R. writes himself about
plant extracts & about Budget.*

and furthermore it will shortly be
closed for the summer. However if
Dr. Roerich would consider buying now
certain apparatus which we will ultimately
be used at Uruvat, on my return in
the autumn I will ^{try} to arrange an inves-
tigation of your extracts.

Very sincerely yours
Vladimir Pertzoff

Hôtel du Belvédère
St. Nizier
Isère.

July 25 '31.

Dear Mr. Shitager,

I left the U.S.A. rather hurriedly to attend to some important matters in Europe and your letter has only reached me now.

I am very sorry that the proposed electric plant is inadequate to supply the need of the Laboratory, but since, as I understand from Dr. Roerich's letter the equipment is not yet bought, perhaps this can be remedied unless you lack water power to drive the plant.

Certainly the laboratory may be heated by some other means if the necessary fuel is available. It cannot be heated by ~~some other means~~ open fires or stoves - this is too dangerous when one has to deal with inflammable liquids. A hot air furnace is quite flexible, but must be placed considerably below the level of the registers. I have never seen a furnace (and I may qualify as an expert on running furnaces) which runs satisfactorily with wood. It is apt to go out in the middle of the night unless constantly attended

Coal seems to be a necessary prerequisite. A hot air furnace of the size required will cost F.O.B. New York about \$250. Hot water or steam about three times as much.

On the other hand I must emphasize that in a climate like yours heating by electricity is really very economical. During a considerable part of the winter heating is necessary for a few hours early in the morning. The electrical heating will switch itself on when the temperature ~~normal~~ falls below a set level, and off again when the desired temperature has been reached. An accurate control of temperature, now adopted in all modern laboratories and quite essential, is really possible (on a small scale) either with electrical heating or with an oil burner, the latter being rather expensive.

On answering your question, I can say you can deduct from your kilowatt consumption the heating of the laboratory, if another adequate heating system can be arranged. The electric lighting of the laboratory is indispensable.

I imagine that with due economy we shall use 10 to 20% less than the total figure given - but this is merely a guess.

I am a poor judge of the general conditions surrounding the problem, but I strongly recommend having an excess of electric power, rather than a deficiency, having in mind future developments in every scientific field.

These considerations may help you and Dr. Roerich to find an adequate solution of this problem.

As to the furniture I think most of it should be made on the place. In October I will send drawings to scale of tables and shelves. The remaining furniture ought to be bought and shipped unassembled. I would be obliged if you would inquire in India the price of cupboards with shelves and glass doors and plain stools. Could you send me information of Indian custom rates for chemical glassware, apparatus and etc? This would be of great help in working out a "purchasing plan".

I will forward shortly to Dr. Roelich the plan for the biochemical laboratory. The plan sent me needed serious modification and its execution has taken some time.

Very sincerely yours
Vladimir Pertyff.

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NAGGAR, Kulu, Punjab.
April 29th 1932.

V.A. Pertzeff, Esq. M.A.
29 Shephard Street
Cambridge, Mass. U.S.A.

Dear Mr. Pertzeff,

Dr. de Roerich told me that you require a plan to scale of the cold room, and I enclose herewith this plan as well as crosssection showing height, etc. Please excuse roughness of the plan, due to absence of drawing tables, etc. and rush of time, but the scale is accurate and the position of the beams, etc. correct to scale. You will note that the cold room is not plastered inside, and I intend leaving it like this until we hear from you, because to my opinion the fixing of the cork plates etc. will be easier if direct to the wood. Should you however want the walls plastered, then please allow another 2" off every wall. The ceiling beams may perhaps hinder a flat ceiling surface, and therefore if you so require and on hearing from you, another ceiling may be put from the beams from below. Allowing for this 1 1/2" thickness, the total height would then come to 9'10 1/2". In this case please also let me know what material would be best to fill the space inbetween the two planks, or should it be left empty? The floor is of stone slabs 2'x2'x2", strong, straight and cool, the joint being cemented. The doors opens to the outside. Is not another door to the inside also required?

I also understand you also require data on mean temperature. This information available is somewhat old, but no recent records have been carried out so far. The figures are based on data obtained in Kulu Village and 6° have been deducted allowing for the 2000 Ft increase of elevation of Naggar above Kulu.

Jan 36 , Feb 35.5 , Mar 42.5, Apr 52.5, May 61.5 , June 69.6

July 72.5, Aug 72.5 , Sept. 67.5, Oct 58 , Nov. 51 , Dec. 41.5

I hope this will be helpful to give at least an approximate idea.

The 20 years' average annual rainfall for Naggar is 20.62 inches for the the 6 months Oct.1st to March 31, and 28.78 inches for the other half of the year, giving 49.40 inches per annum.

In case the following information may be of use to you, I would like to state, referring to your Nov. 1931 blueprint, that the size of the photometric Lab is 9x15', allowing 2' more for the corridor on the western side to arrange for the putting up of the staircase to the upper floor. As the photometric Lab was previously planned 8x14, it still remains 23 sq ft larger and we therefore trust will be found O.K. The large two laboratories (Physical and General) being larger than anything so far built in Kulu Valley, and to make quite safe the long ceiling beams, which also have to support part of the upper floor, have 6x6" columns in the very center, to be fully on the safe side.

With very best wishes

Yours sincerely,

ENCLOSURE:

1 Plan of Cold-Room.

P.S.No copy of the enclosed plan it has hand, therefore in case of any special requirements, please return the plan the corresponding instructions,

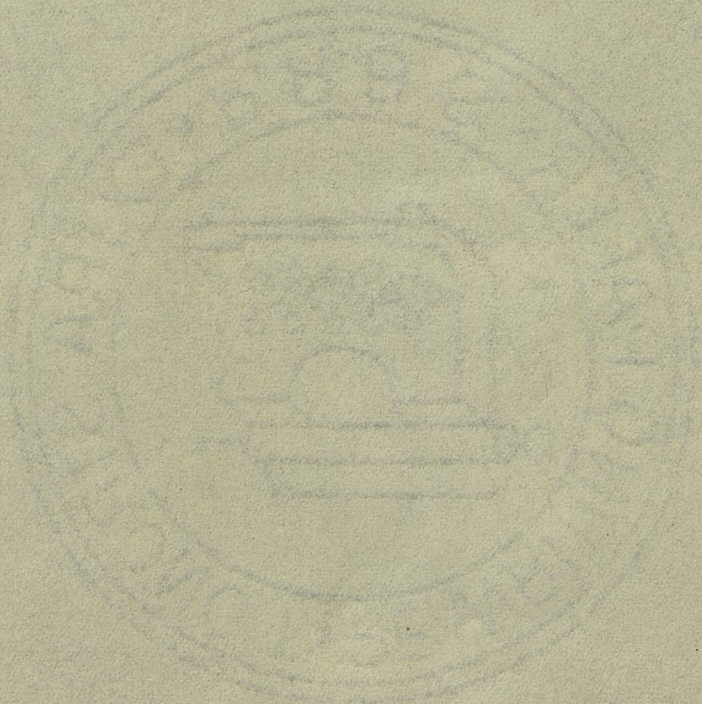
May 4, 1932

Dear Mr. Pertzoff,

Further to my letter of Apr. 29th, I find that on completion the stone floor in the Cold Room is two inches higher than shown on the sketch, please take this into consideration, as the height of the room is thus 9'10" to the beam and 10'3" to the ceiling planks.

Am sending this letter by airmail in order that it may overtake my letter of the 29th, and trust that thus no inconvenience will be caused in this respect.

Yours sincerely,



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NAGGAR, Kulu, Punjab, Dec. 1, 1932

V.A. Pertoz, Esq. M.A.
Cambridge, Mass. USA.
135 Ivy Street
Brookline, Mass. USA

Dear Mr. Pertzoff,

I am extremely sorry to trouble you again with some questions pertaining to the hydro-electric installation, but knowing your kind continuous offers to our Director to help in this matter, we hope that you will not mind clearing up this complication. I understand from your correspondence with the Director that you advise us to insist on a 60 cycle frequency current, and when Mr. E.N. Webb, DSO, MC, the Manager for India of the firm who seem to be the only capable organization in India to put up this installation, was recently here to inspect personally the site and chances, I tried to convey to him this your point as insistently as possible. He told us however, that the whole of the British requirements including all colonies is always 50 cycles, that of course if we insist it would mean making special machinery in England, and if we have any trouble with the generator, spare parts would again have to be specially ordered in England (or elsewhere abroad) as the Indian market stocks only the standard 50 cycle machinery parts, that this may mean having to wait 5-6 weeks, etc. etc and all this only for the sake of a few instruments, less than 10% of of the total consumption, as he said for heaters etc there would be no point to use 60 cycles. He thinks that only the thermostats etc. totalling 7.85 (as per your list in your letter of May 8, 1931 to which we adhere) would come into question and suggests a frequency changing set for sales rather than having the whole arrangement 60 cycle. I am enclosing his letter and we shall be greatly obliged for your technical, also whether single or 3 phase current is required. His point on the face of argument that it would be difficult to get spare parts if required, seems to put the responsibility of possible inconve-

niences on us, and we could not decide on this question, without your final statement, after you have taken all their considerations into weight. Your early reply will greatly oblige.

May I also take this opportunity to enquire, with reference to your letter dated February 6 1932, (giving all the particulars of the installation, furniture) how we are to understand your reference therein that two mains are to be conducted along the walls, one DC and one AC. Not being an expert myself in questions pertaining to the requirements of your apparatus, are we to understand from this that some other transformer is to be put to change part of the AC current into DC and if so, how much of it and what changer would be recommendable for this? Your previous requirements mentioned that AC, 105-115 V is desirable and we have based all our demands to the manufacturers on this. It may be that this transforming from AC to DC is such a minor question, that it is not worth mentioning, but to us who are confronted with the experts questions on this and similar point, your enlightening us on it would be highly welcomed.

I hope not to have intruded too heavily into your valuable time and am awaiting your particulars with interest, to enable us to have things arranged here to the best possible adaptability to your requirements.

Yours sincerely,

VLADIMIR A. PERTZOFF
135 IVY STREET
BROOKLINE, MASSACHUSETTS

Dec. 20 '32

Dear Mr. Shytalov,

Under separate cover I am sending you a catalog of laboratory furniture made by E. H. Sheldon + Co. The company is a well known firm, which recently equipped the chemical Laboratories at Harvard.

Over certain of their designs I have written my own comments concerning their applicability to our problems. This catalog will give you the opportunity of "seeing" the various pieces of furniture we use for our work.

I am sending you my tardy, but nevertheless sincerely wishes for a better new year and a happy Christmas.

Yours

Vladimir Pertzoff

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VLADIMIR A. PERTZOFF
135 IVY STREET
BROOKLINE, MASSACHUSETTS

Dec. 28 '32.

Dear Mr. Shitayev,

I have your letter of Dec. 1st. On Dec. 24 I sent a night letter to Roerich, Vraggar, India: "Three phase current fifty cycles satisfactory do not order a frequency changing set writing Merry Christmas Pertzoff". I hope it reached you.

I understood you were ordering an American generator and therefore insisted on 60 cycles. I understand, that there will be many difficulties to overcome if you acquire an English 60 cycle generator as there would be no spare parts available.

I see, now we shall have to restrict ourselves to buying English motors. With the exchange in our favor, this may cost about the same as American ones. The few available motors ~~we have~~ built for 60 cycles will probably run for a little while, though they will heat, and their life will be shortened. But since they have run already 2 or 3 years I do not particularly care.

It is therefore agreed, unless I hear from you to the contrary, that the laboratory shall be supplied with a three phase 105-115 volt 50 cycles current.

I shall be obliged if you will en-

lighten me about English motors. Motors which we use in the laboratory here, are usually induction motors, running between 1,000 to 4,000 revolutions per minute, of the following sizes: $\frac{1}{50}$; $\frac{1}{30}$; $\frac{1}{10}$ and $\frac{1}{4}$ H.P. (one is needed with following specifications: $\frac{1}{4}$ H.P. with speed of 1,750 r.p.m. and a 3 inch pulley). Could you write me if such motors are available in India. What is their prices?

Please do not worry about 110 d.c. current. The d.c. current, which my laboratory, occasionally needs, I had in mind to obtain by a motor generator. A motor generator looks like two motors locked together, one running on a.c. generates in the second a d.c. current. That which I had in mind converts 110 volts a.c. 60 cycles into a 110 d.c., $2\frac{1}{4}$ amp., 250 watts current. It weighs 76 lbs. and costs f.o.b. New York \$85.00. Please inquire and find whether the laboratory can obtain through English channels a generator of about this same capacity. Please let me know its specifications and price. It would be foolish to acquire one for 60 cycles and turn it up. In my letter of Febr. 6 1932, if I remember rightly, this generator is placed in the corridor preferably on a shelf, above one's head. It must have a switch, since as I said it will not run continuously.

The laboratory also needs a 6-8 volt direct current. In the U.S.A. there are

available small converters costing about \$10 each and using the 110 a.c. current. This 6-8 volt current is used to manipulate the relays in the thermostats, for electrolysis, etc. The relays consume very little current. No wiring was specified for this current, because it is easier to put one converter in each laboratory and run from it ordinary bell wires to the places needed. Is there anything like this in the English market? I am afraid the American type will not do well when fed 50 cycles.

Please "intrude heavily into my valuable time" - it is exactly for this purpose.

Sincerely yours
Bladimir Pertzoff.

NAGGAR

Kulu

Punjab

Br.India.

4 * FEB * 1933

Dear Mr. P e r t z o f f ,

I acknowledge with thanks your letter of Dec.20 and 23th. Your wire has also been received by the Institute, and the estimate so far obtained is for a three phase, 105-115 volt 50 cycles current. I have now sent your inquiries about:

- a) specification and cost of English motors as per your sizes.
- b) specification and cost of generator converter as per your quoted capacity
- c) specification of small 6/8 V.D.C. converter

to the Manager of the firm and will let you know the reply as soon as received. They will probably write to England about this.

I cannot express adequately how deeply touched I was that you have sent me already the second book "with your compliments" - and just the kind of books which are most interesting and useful. Please accept my sincerest thanks.

I regret there is so little here in our solitude, that I could send you by way of reciprocity, but perhaps you will accept with my compliments a small Kangra-Rajput school painting, which though I am afraid is not very valuable, is yet quite a typical example of its type. I am sending it by next mail rolled up in a magazine and trust it will reach you safely.

It is very kind to permit to "intrude heavily upon your time" but I believe for the moment there is not much more to inquire.

Sheldon's Laboratory catalogue has also been received and I am studying it in connection with the sketches previously sent by you.

With very best greetings, and thanking you once more for your kind thoughts

Yours sincerely,

BOVING AND CO LTD

LAHORE, Feb. 28th 1933.

No. 7/27.ENW

CHAKKI H.E.SCHEME - URUSVATI INSTITUTE, NAGGAR

Dear Sir,

-
- A. Since I have based on supplying current at 400/230 Volt, a small 2/1 ratio transformer would be required for supplying the 105-110 V current. Price approx. ₹ 120:-
- B. 1/50, 1/30 and 1/16 bhp motors, speed 3500 rpm: price ₹ 45 each approx.
1/6 , 1/4 bhp motors, speed 1430 rpm, Price ₹ 70 for the 1750 rpm motor a slightly larger pulley could be fitted readily to obtain the same belt speed.
- C. We would suggest a standard 0.75 KVA Rotary Converter as used for the TALKIES, Price ₹ 300 approx.
- D. Propose a Tungar Rectifier 6/12 volt D.C. 5 amps. Price ₹ 80 approx.

These items are all standard British products mostly stocked in India which would provide for complete reliability and easy replacement if ever necessary.

I hope this now supplies all the information which your friends need and that they will be able to reach an early decision to proceed.

Yours faithfully,

For Boving and Co. Ltd

Sgd E.N.Webb

P.S. roughly calculate ₹4 to the dollar
for above prices, which are Calcutta
prices (already including duty, transport, etc).

WILH.K. HEINZ.

FABRIK CHEMISCHER PHYSIKALISCHER GLASAPPARATE U. THERMOMETER
STUTZEBACH.

Monsieur

VLADIMIR A. PERTZOFF,

29 Shepard Street,

CAMBRIDGE, Mass. U.S.A.

Dear Sir,

Confirming with much thank the receipt of your favour of 22nd ult. I beg to inform you, That I am very interestingf for the laboratory equipment of the Mr.Dr. G.N. Roerich, Director of the Urasvati Institute of the Roerich Museum.

If the Institute buyes for an amount of \$ 2.000 I am the agreable situation to give much credit Mr.Dr. Roerich could pay the invoice in 3 parts, one third 4 month after delivery, the second 12 months later and the rest 12 months after the second rate.

Please informed this customer, that only glassapparatus of the first quality to be exported. If the Institute is begging for a catalogue you will have the kindness to handover your exemplar and then I send to your esteemed adress anew one

With the best recommendation I am likely awaiting your further news and remain, dear Sir,

Sincerely Yours,

Institute asking for Laboratory Glasswares of high class, I beg to offer my house amnd thank for it in anticipation.

NAGGAR, Kulu, Punjab, Br.India

March 6, 1933

Dear Mr. Pertzoff,

Further to my letter of Feb.4th, which I hope has reached you, I can now enclose the reply of the engineers with regard to the various questions mentioned in yours of Dec.28th ult. , which I hope will give you the required information. I have made a P.S. about the present dollar rate, which will help you to compare the prices with those in New-York; of course it has to be taken into consideration that the rupee prices include already the high duty of import into India, and transportation to India.

You know no doubt that our vol.DII is already in print, as a matter of fact we expect it to be delivered to us in the second half of March, when the JOURNAL and the REPRINTS of your article will be sent to you.

With all very best wishes in the meantime

Yours sincerely,