

The Lesson

On the slopes of Whistler Chris did ski,
Swishing and swooshing, happy as could be,
But alas, poor Micheal didn't look well,
What could be wrong with him, pray tell?

Micheal! Micheal! You look blue,
Me oh my, what to do?
I think I'm hypoxic; yes it's true,
Tell me Chris, what should I do?

Well Micheal, first thing's first,
You're not hypoxic, and you certainly won't burst.
We're only at Whistler, you silly boy,
Maybe you've simply drunk too much soy.

But Chris, whatever could you mean?
I'm way up high, that can be seen.
Yes, but Micheal, not high enough,
Those who are hypoxic really have it rough.

But look at me; I'm turning blue,
I think I'm dying, surely it's true.
No Micheal, definitely no,
Different symptoms you'd need to show.

Now Micheal, you can see me, this is true?
And it's dusk, you admit this don't you?
Well Micheal my boy, if hypoxia were so,
Your night vision would have been sure to go.

And Micheal, you're talking to me,
Loss of mental function I surely don't see.
So you see Micheal, hypoxic you're not,
For the telltale signs you haven't got.

Chris, I don't know, I'm still not convinced,
I'm breathing quite slow, and I'm starting to wince.
Well Micheal, while this is so,
There are a few things you clearly don't know.

If you were hypoxic you wouldn't breathe slow,
Quite the opposite, don't you know?
Micheal, I must tell you of acclimatization,
A tell tale sign of which is hyperventilation.

You see my boy, hypoxia activates peripheral chemoreceptors,
Surely you remember, they're very sensitive, special detectors,
They sense all kinds of things, yes siree,
Like high P_{CO_2} , not to mention a H^+ that recedes.

So what I'm saying is you'll get respiratory alkalosis,
And as you go up, they'd have to increase your doses.
But Chris, doses of what? What do you mean?
I clearly haven't read what you've seen.

Well Micheal, you'd need O_2 ,
For as you go up, down comes $F_I O_2$.
This is because, surely you know,
Way up high, barometric pressure is low.

So you see, what I'm trying to explain,
Is there's no reason for you to disdain.
But so you believe me, and to put you at ease,
I'll tell you the symptoms of hypoxia, if you please.

With acute mountain sickness, a headache sets in,
As can GI upset, as quick as a spin,
Or maybe fatigue, weakness, or dizziness,
And if not those, insomnia or light-headedness.

So you can see, these symptoms aren't yours,
Even though you have slightly blue pores.
Besides Micheal, that's only the start,
As you keep going up, there's problems caused by the heart.

High altitude pulmonary edema is surely a concern,
So listen up and maybe you'll learn,
For in H.A.P.E. it'll start with dyspnea,
And soon progress to tachypnea.

There's vasoconstriction in the pulmonary circulation,
Contributing more to hyperventilation.
Tachycardia will attempt to correct,
But it's not enough, and you'll be a wreck.

And knowing you Micheal, you wouldn't stop there,
But would keep going up, without any cares.
Unfortunately for you, your body can't keep up,
And as $F_I O_2$ drops, you'll wish you were only throwing up.

For you see, now it's the brain that's deprived,
And you'll likely collapse soon after you arrive.
High altitude cerebral edema sets in,
And as your brain swells, your mental capacity wears thin.

Now you're in trouble, and death is near,
And likely now, even you'll show fear.
So down you must go, but not just to rest,
First thing's first, you'll need to decompress.

But Chris, while all this is true,
I still don't see why I'm turning blue.
Couldn't it be that I'm hypoxic?
I feel like my body's totally toxic!

Well Micheal no, as I've tried to show,
At only intermediate altitude, oxygenated blood will still flow.
It's only above 8000 feet,
Where O₂ becomes somewhat of a treat.

Besides, you're in good shape,
If you pace yourself at a respectable rate,
You could reach over 14000 feet,
Before you begin to feel less than neat.

OK, I understand, but Chris I'm confused,
My friends run up high, and they're well perfused.
Why aren't they sick? Why don't they die?
I don't see why they'd train up so high.

Well Micheal, there's one point you've missed,
For rate of ascent must be long so you don't develop altitude-induced bliss.
You see Micheal, if you go up slow,
Altitude sickness will likely not show.

And you see, when you train up so high,
You increase hematocrit because your Epo release increases as you try.
As you exercise up there, the blood gradually carries more O₂,
Just be careful because the viscosity of that blood increases too.

Oh what does that matter? I'll train up there.
I'm sure a little viscosity won't kill me in that air.
Well Micheal, it could. That's why you go slow.
Wow, there's so much you really don't know.

Chris, I'm so lost, confused, and don't know,
What do I do? Where can I go?
Well Micheal, the answer's at school,
Call Dr. Osborne and take Physiology 422.